EFFECTIVE INFORMATION DISSEMINATION TO A COMMUNITY IN CRISIS

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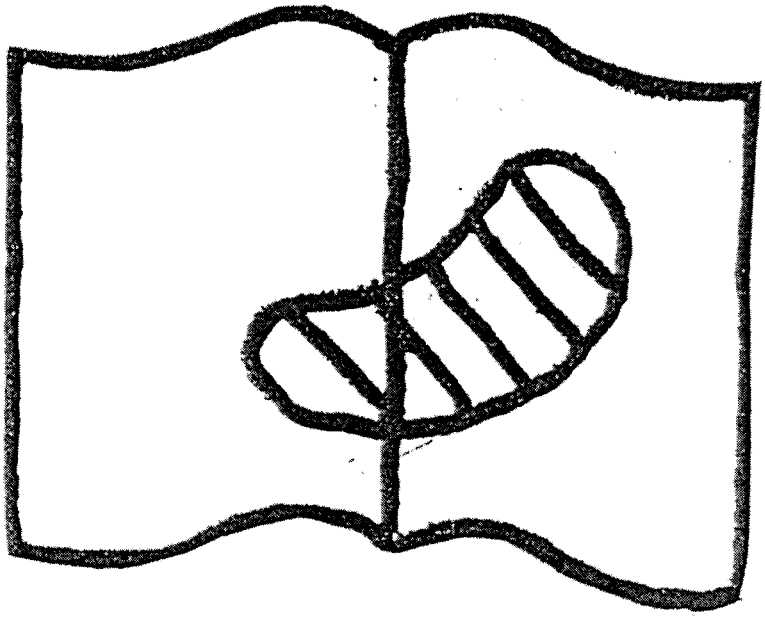

Effective information dissemination to a community in crisis

In 1998 a village in Northumberland was at the centre of a suspected TB infection. This thesis describes a research project that aimed to characterise and evaluate the dissemination of information to the community during the crisis. The context within which the incident occurred is discussed, and the main areas of research within which this project is located are reviewed.

The following objectives were set for the project –

1. To determine existing evidence of effective information dissemination
2. To determine the criteria for dissemination in the specific context of the crisis
3. To identify and develop research methods that reflect the cross-disciplinary nature of the topic.

The project employed a broadly qualitative methodology and was firmly grounded in information science.

A qualitative systematic review of research literature identified the existing evidence of effective information dissemination. The technique was adapted from systematic reviews conducted in health research. Twenty relevant studies were identified and their results synthesised and analysed using a meta-ethnographic approach. From this analysis the elements of effective dissemination were extracted, and when combined produced a model of effective information dissemination.

Interviews conducted with key informants ascertained the criteria specific to the TB incident. The information providers for the information dissemination process set three explicit criteria during the TB incident. These criteria were underpinned by a set of assumptions about the audience for the information.

A questionnaire survey of respondents in the community was conducted to incorporate their perspective in the evaluation. Analysis of the survey and interview data shows that, whilst the criteria set for the dissemination process were mostly achieved, the assumptions underpinning the dissemination process were not wholly correct. The research data was compared to the model of effective information dissemination. Additional elements were identified and a model of effective information dissemination in a crisis was produced. Further research is required to test the validity of this model. It is proposed, however, that extracting the elements from the unique situation enables translation of the research findings to other crisis situations.

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1.1 Introduction

The crisis in the title of this research refers to an incident in late 1997/early 1998, when routine Tuberculosis (TB) screening of schoolchildren in Ponteland, a village in Northumberland, recorded abnormally high positive results. This research project studies the dissemination of information to the community during this crisis.

The research is thought to be unique in considering a health crisis from an information studies perspective. Previously, research has considered crisis situations from a management perspective (Broughton 1989, Pijnenburg & van Duin 1990), an information systems perspective (Pelletier & Msukwa, 1990) or a risk communication perspective (MacLehose et al., 2001). The unique perspective of this study, moreover, highlights information behaviour, and more specifically information seeking style as an important facet of information dissemination during the crisis.

The research, however, also borrows from, and contributes to, the risk communication and diffusion of innovation research domains, due to the nature of the crisis and the focus of this project on information dissemination. Both of these research areas highlight the importance of opinion leaders and the media as information sources in the dissemination process. In addition the concept of targeting information to the specific audience, was an aspect of information dissemination highlighted by social cognitive theory and social marketing theory, both research areas closely related to diffusion of innovation research.

Prior to consideration of the dissemination of information in the specific circumstances of the suspected TB crisis, a qualitative systematic review of the research literature was employed to determine the existing evidence of effective information dissemination in general. The qualitative systematic review was an adaptation of an existing research method employed in medical research, and thus reflected the cross-disciplinary nature of this research project. The findings of the qualitative systematic review resulted in the production of a model of effective information dissemination. This model incorporated the concepts of information seeking style, the role of opinion leaders and targeting information as key elements in the process.

This model was used as a framework for the evaluation of the information dissemination to the community during the crisis. The key elements of the model were explored in the interviews with key informants, and the questionnaire survey of community residents. This evaluation process highlighted two further key elements of effective information dissemination, the assumptions about the audience held by the information providers and the importance of homophilous communication to the information recipients. The culmination of this research project was, thus, a model of effective information dissemination in a crisis incorporating both the key elements of the original model and the factors highlighted by the evaluation of the information dissemination to the community in crisis.

1.2 The crisis

1.2.1 Abnormal results

Routine TB screening of one year group of schoolchildren attending schools in Ponteland, recorded positive test results consistent with contact with an individual carrying an active TB infection. Contact tracing failed to discover the source of the apparent infection, so the screening process was extended to all children attending primary and middle schools in the area. At the culmination of this extended screening process the Health Authority had identified 225 children with positive test results. These children were then given further tests, and those with positive results were given chest x-rays and advised to follow a six-month programme of medication.
At its height the test results indicated that the community was in the midst of the biggest TB outbreak in the region since the Second World War (Welford, 1998). Naturally the incident caused alarm and distress within the community, both during the screening and testing process and the course of the medication (Allison, 1998). During the screening process various issues contributed to the sense of crisis felt within the community. Parents of children living in the area but attending schools in other areas, for example, were particularly keen to ensure that their children were not excluded from the screening process. After representations from concerned parents these children were eventually accommodated in the local schools screening programme (TB update 25/02/98).

Parents of pre-school age children were also keen to have them tested for possible infection (TB update 4/2/98). The health professionals, however, were of the opinion that as the weeks passed and none of the children tested proceeded to develop signs of the active disease, accurate interpretation of the results of screening tests on pre-school children would be difficult to achieve (TB update 25/2/98). Round and Palmer's study (1998) of meningococcal infection in school age children considers, for example, that widespread vaccination can lead to false reassurance about infection regarding related bacteria. Pre-school children were, therefore, not offered screening, although parents continued to voice their concerns. Failure to identify a source for the suspected infection inevitably fed the rumour and gossip rife in the community at the time.

Whilst the definitive source of the abnormal test results remains uncertain to date, the most likely explanation given for the test results was that the incident "was caused by a mycobacterium (unspecified but not TB) from the environment" (Jones, 1998). Results of questionnaire surveys of the children's habits indicated the importance of the local swimming pool in the children's school and leisure activities. Thus, a number of children attending village schools in rural Northumberland and school swimming lessons in Ponteland pool when tested also recorded positive test results.

During the course of these events the nature of the crisis changed considerably. At the outset, the community faced an outbreak of TB infection amongst schoolchildren, on a scale unheard of for decades. Some months later, when the possibility of large-scale TB infection had passed, interest in the topic, within the community, had dwindled to such a degree that a public meeting about the crisis was cancelled through lack of attendance.

Indeed, when referring to the suspected TB outbreak as a crisis in the course of the fieldwork interviews, respondents sometimes denied that this was an appropriate term to apply. Their stance was, however, taken with the benefit of hindsight and in the knowledge that none of the children with positive test results proceeded to develop the active disease.

The dictionary definition of a crisis is "a time of great disagreement, uncertainty or suffering" (Cambridge, 2002). The suspected TB outbreak was certainly, for this community, a time of 'great uncertainty', thus the situation does merit the description of a crisis.

If using a strictly medical definition of the events in Ponteland, the situation is more accurately described as a suspected TB incident, as no child developed the active infection. This definition has been employed in this thesis to reflect the medical origins of the crisis.

The debate about the status of the situation is, moreover, another aspect of the uncertainty surrounding the events of that time.

Two of the children with positive test results were the, then eight and eleven year old, sons of the researcher. Their involvement in the incident provided the initial interest in the incident and the information dissemination effort, whilst the motivation for the research project detailed in this thesis came from the researcher's background in information studies.

1.2.2 Informing the community

Throughout the incident the community of Ponteland sought reliable and relevant information from both health professionals and other information sources. The health professionals managing the incident issued newsletters on a regular basis (See appendix 1). Initially, these were distributed through the schools but in response to demand in the community they were also made available in doctors surgeries, shops, the local library and on a website (TB update 17/02/98). In addition, residents were invited to attend open meetings held in school and village halls. In the early stages particularly, the incident also received wide coverage in both the local and national press and television (Bosely 1997, Oldfield 1997, Elliott 1997, Tyne Tees 1997).

The process of dissemination is often, however, an afterthought of information production, although information is of little value if it does not reach the intended audience (Karfoot, 1992). Well-planned dissemination strategies can optimise the impact of the information provision effort by ensuring that the right information reaches the right person at the right time. In crisis situations, in particular, the effectiveness of the dissemination strategy employed may have significant implications for both the information provider and the intended recipients. MacLehose et al's (2001) study of an incident of widespread mercury contamination noted, for example, "one of the main reasons that the incident continued over such a long period of time was the contamination of the vacuum cleaners and washing machines." The researchers found, moreover, that "information advising people against the use of

these appliances where mercury has been spilt could have been publicized more effectively."

This research project aims therefore to characterise and evaluate the dissemination of information in the Ponteland crisis. Patton (1990) states, "evaluative research is judged by its practical utility to decision makers, policymakers, others who have a stake in efforts to improve the world." It was anticipated that successful completion of the project would inform both the information providers and the wider information community.

The research question ultimately set for this project was two-fold. The initial stage of the research relates to information dissemination generally and is in response to the question –

"What evidence exists of the effectiveness of information dissemination strategies?"

The second part of the research question, on the other hand, relates to the situation in Ponteland specifically and is in response to the questions –

"What were the criteria set for the dissemination process in the Ponteland incident, and were they achieved?"

1.3 Background

1.3.1 The project

Whilst my children's involvement in the incident provided the initial motivation for the research, a number of other factors contributed to the form that this project ultimately took. Primary amongst these factors was the researcher's background in information studies. A recently completed degree course in Information and Library Management was characterised by an emphasis upon the study of information provision and use. Thus, although the crisis in Ponteland was medical in origin the research was firmly grounded in the information studies field.

As the incident was medical in origin but the research was from the information studies perspective, the project is cross-disciplinary in scope and the methods used in

the project need to be appropriate to both the health and information studies research traditions to ensure that readers from either discipline can relate to the conduct of the research and the credibility of the research findings.

Additionally, as a PhD research project, the research must be deemed to have made an original contribution to the research literature. The combination of these two factors provided the impetus for the employment of the systematic review technique in this research project. The technique, which is discussed in greater detail later (See Chapter 4) is a recognised research method in health research but is new to the field of information studies research. The systematic review was employed in the initial phase of the research in the expectation that it would provide an answer to the first of the questions posed above. Subsequent phases of the research utilised key informant interviews, a questionnaire survey and telephone interviews with members of the community to provide data, from which it was anticipated answers to the second set of questions would be extracted.

A review of the literature indicates that, whilst dissemination research in general has a considerable body of publications upon which to draw, consideration of the process in a crisis situation is scarce (Sherwood, 1990 Luker & Kendrick, 1995 Buckland & Gann, 1997). It was anticipated, therefore, that successful completion of the research would make an original and practical contribution to the research literature.

1.3.2 Ponteland

To appreciate some of the alarm and distress generated by the TB incident, it is necessary to first of all understand the community within which the incident occurred and also the nature of the disease itself. The village of Ponteland is the second largest settlement in the Borough of Castle Morpeth, which itself separates the urban south east of Northumberland from the large rural areas of the West and North of the County. Ponteland is located eight miles northwest of Newcastle upon Tyne.

A village has been located at the crossing of the River Pont since Norman times, but the founding of the adjoining 444 hectacre Darras Hall Estate in 1910 provided the basis for the large settlement that exists today.

Ponteland's settlement character is unique in the Northeast region, with the Darras Hall estate development of executive housing, in a largely mature landscape

environment, attached to the much smaller and more compact Ponteland village (Castle Morpeth, 1994). Major new housing developments on the Estate in the 1950's, 1960's and 1970's established Darras Hall as a high quality residential area, attracting some of the "north-east's highest earners" (Herald & Post, 2002). The village and adjoining Estate are now a major dormitory area for professional and managerial staff who work in Newcastle upon Tyne, the nearby Newcastle airport and elsewhere on Tyneside (Northumberland CC, [n.d]). The whole settlement has been surrounded by Green Belt land since 1963 (Castle Morpeth, 1994). Thus the community was separated from the urban and rural settlements surrounding it, both geographically and demographically.

The population of Ponteland trebled between 1971 and 1991 (the latest year for which figures are available) when it was recorded at 11,178 inhabitants (Castle Morpeth, 1994). In the same time period the number of households also showed a four fold increase. Of particular relevance to the TB outbreak is the above average proportion of young people in the 10 to 19 years age group and adults in the 40 to 54 years age group recorded in the community. These figures suggest that the community incorporates an above average number of families with school age children within its boundaries, and hence, perhaps, the impact of the positive screening results was particularly significant.

By way of contrast, the villages of Cambo and Belsay, which were also involved in the incident through the children attending their village schools, between them number only 870 residents. Both villages are designated Conservation areas, and were originally part of larger estates now in National Trust and English Heritage ownership respectively (Northumberland CC, [n.d.]).

It is, therefore, apparent that the community involved in the TB incident encompassed a mix of both rural and suburban settlements. Both of these facets of this community are relevant with regard to the nature of TB infection discussed below. In addition, the affluent and mobile characteristics of the community were also relevant factors regarding the perceptions held about TB, both within and outside the community.

1.4 Tuberculosis

1.4.1 History of TB

Robert Koch discovered *Mycobacterium tuberculosis* in 1882. For his pioneering work in bacteriological research he was awarded the Nobel Prize for medicine in 1905. Tuberculosis (TB), particularly in adults, spreads slowly and widely breaking down respiratory tissue and forming cavities in the lungs. When an individual thus infected coughs, sneezes or spits, TB germs (known as bacilli) are propelled through the air thereby spreading the infection. An individual only has to inhale one of the bacilli to become infected. Most people infected with the germ do not progress to developing active TB although "infection with the tubercille bacillus is common in childhood" (Encyclopaedia Brittanica 1999). Failure to treat the infection, can however lead to development of active TB at a later stage when, for example, other factors such as stress or alcohol abuse reduce the effectiveness of the body's immune system.

At the time of Koch's discovery the death rate in the US and Europe from TB, which was approximately 200 per 100,000 (Glaxo Wellcome, [n.d]) had been gradually declining throughout the century and, indeed, continued to decline throughout the first half of the twentieth century. The introduction in the 1950's of effective drug treatments and the development of the BCG (Bacillus Calmette-Guerin) vaccination represented, it was believed, one of the great advances in 20th Century medicine (Encyclopaedia Brittanica, 1999).

1.4.2 Re-emergence of the disease

1.4.2.1 TB and HIV/AIDS

Despite the breakthrough in the treatment and control of TB that the BCG appeared to be, the World Health Organisation (WHO) declared TB to be a global emergency in 1993 (Bosely, 1998). TB is still the leading cause of death associated with infectious diseases (Bakhshi, Hawker & Ali, 1998) and it is estimated that "between 1999 and 2020 ... 200 million people will get sick, and 70 million people will die from TB"

(WHO, [n.d]). There are a number of factors behind this apparent reversal in the control of TB of which one of the most important is the link between TB and HIV (Human Immunodeficiency Virus) whereby the presence of each speeds the progress of the other. The WHO stated "by the end of the century HIV infection will annually cause nearly 1.5 million cases of TB that otherwise would not have occurred (WHO, [n.d]). A study undertaken in Spain in 1995 reported that 28% of all new tuberculosis cases are infected by the HIV (Villalbi et al., 1999).

1.4.2.2 New strains of TB

Two of the most important factors in the rise of TB not accounted for by the co-infection of HIV, are the spread of the disease through the movement of people and the emergence of drug resistant strains of TB. The displacement of large numbers of people, such as refugees, is helping to spread the disease. The infection spreads quickly in places such as crowded refugee camps, but as the prescribed treatment takes between six and eight months to eradicate the infection, it is extremely difficult to treat patients effectively in these circumstances. Of more immediate concern to the inhabitants of the industrialised West, is the fact that the movement of people from countries where TB is prevalent is an important cause of the increasing incidence of the disease in industrialised areas. A detailed survey of TB cases in 1993 in England and Wales showed that most of the rises in TB occurred in inner city areas or in people who had recently arrived from countries where TB is more common (PHLS, 1999).

The over-use of antibiotics has been blamed for the appearance of drug-resistant TB although inconsistent or partial treatments, when patients do not complete the course of treatment, have also played a significant part. It is worth noting here that as the incident in Ponteland progressed and it was suggested that the source of the positive results was not TB, the health professionals were keen to point out that the children already on medication for TB should complete the course as prescribed (TB update 25/02/98). The financial costs for the treatment of drug-resistant TB have been calculated to be up to 100 times higher than those for the treatment of the conventional form of the disease (WHO, [n.d]) and as such are beyond the means of the majority of health organisations in developing countries. In addition, even in the

UK the facilities for safely managing multi drug resistant TB are limited (Schmid et al., 1999).

1.4.2.3 Other factors

Historically the incidence of active TB has been closely associated with social deprivation factors such as overcrowding and malnutrition. Recently, these conditions have been apparent in the significant increase in cases recorded in inner city areas, such as New York, San Francisco and London (WHO, [n.d]). In London, for example, a recent report stated, "fifty people develop TB each week and two of those die from the disease" (BBC, 1998).

One other aspect of TB worth noting in relation to the suspected outbreak in Ponteland, is that the TB infection can also be present in cattle, with the possibility of the disease being transmitted to humans through dairy products. Infections thus caused often result in deformation of bones and joints. Prior to widespread pasteurisation of milk, which kills the TB germ, many cases of hunchback were caused by bovine TB infection (Encyclopaedia Brittanica 1999). The infection has also been found in badgers, who it is suspected spread the disease to cattle, most notably in the South West of England where a highly controversial and unsuccessful culling policy has failed to reduce the incidence of infection (Colston, 1995). Ponteland village, situated on the edge of rural Northumberland, was host to a regular cattle market and a number of the children attending schools in the village live on outlying farms.

The combination of an affluent, professional population and a disease associated with social deprivation, concerns about TB in cattle and the proximity of a cattle market to the village were all factors contributing to the sense of crisis experienced by the community. Other relevant, but less immediately obvious factors, were the health beliefs held by the members of the community and the models of illness subscribed to by the health professionals.

1.5 Health

1.5.1 Health models

Health models have been developed in an attempt to explain the causes of disease and to suggest cures compatible with the perspective. A basic definition of health distinguishes between the medical model of health and the social model (Childs, 1990). In the former, health is defined as the absence of disease. Cure, rather than prevention, is the particular aim of this model. The social model, on the other hand, is best defined by a World Health Organisation (WHO) statement that describes health as physical and social well-being in addition to the absence of disease (WHO, [n.d]). This social model takes a more holistic view that encompasses a range of issues typified by the Healthy Cities projects (Ranade, 1997). In the first phase of the WHO backed Healthy City movement, 35 European cities undertook amongst other commitments to-

1. Move health high on the political and social agenda of the city and develop healthy public policies at the municipal level
2. Create innovative action for health that emphasises the interaction between people, environments, lifestyles and health.

Clarke (1991) lists three types of health model: -

1. Medical model, which has a curative and individualizing stance towards the genesis and cure of illness
2. Political economy model, which focuses upon the ways that disease results from inequities in the social system
3. Lifestyle model, which tends to see disease and death as the result of faulty lifestyle choices made by individuals.

Moynihan, Heath & Henry (2002), moreover, recently proposed a fourth model type, the corporate construction of disease, in which "the boundaries of treatable illness are broadened to expand the potential markets for those who sell and deliver treatments."

Although the medical model has been the most prominent ideology for most of the last century, Ranade (1997) states that a successful strategy for health must tackle its socio-economic and environmental determinants and replace the existing, dominant biomedical model of health with a social model. In respect of TB infection, for example, the links between social deprivation and the incidence of TB encourage the adoption of the political economy model above to prevent the spread of the disease. The high incidence of coinfection from HIV and TB will, on the other hand, lend credence to the lifestyle perspective when issues surrounding the disease are debated. The three models are also evident in the history of the disease discussed above. The discovery of the BCG vaccination is firmly located in the medical model of illness, whilst the declining death rate throughout the 19th century was due to improvements in sanitation and housing, both components of a political economy model. The rise of the disease today, however, is in part due to substance misuse and sexual behaviour, both lifestyle choices.

Each model has implications for the management of infection. Thus, in an incident like that experienced in Ponteland, subscribers to the medical model of illness view the positive test results as an indication of infection for which the appropriate medical regime should be instigated. Adherents to the political economy model, however, look beyond the infection to identify the wider social issues that might have caused the outbreak and bring attention to these issues. Proponents of the lifestyle model, on the other hand, look at the activities and habits associated with the infection and through health promotion campaigns encourage the adoption of lifestyle changes to halt the spread of the infection.

In fact, all three of these perspectives were demonstrated during the incident to varying degrees. In the early stages of the crisis the medical model was to the fore with identification of the source of infection and appropriate treatment for the infected children being of paramount importance (TB update 06/01/98). As the situation changed and no obvious source of infection was identified the investigations into the outbreak widened to incorporate the social context within which the incident occurred. A questionnaire survey requesting details of the children's social activities was distributed to all of the children in the community (TB update 20/1/98, TB update 11/2/98). With regard to the lifestyle model, the health professionals managing the incident were at pains to point out that neither living in Ponteland, nor using the local

swimming pool were implicated as specific sources of infection (TB update 11/2/98, TB update 30/6/98).

1.5.2 Health beliefs

The models of illness discussed above pertain to the providers of health services and their role in the diagnosis and treatment of disease. The health beliefs held by an individual, however, are also relevant in this situation, particularly in relation to understanding the nature of the infection and compliance with treatment programs (Helman 2001, Hsu & Gallinagh 2001, Curry et al. 2002). The sources of an individual's health beliefs are many and include ideas from the professional sector, the popular sector and the traditional sector (Ailinger & Dear, 1997).

The professional sector in a health context, incorporates all the health workers to whom the individual is exposed both before and during the course of diagnosis and treatment. As mentioned above, health professionals predominantly adhere to the medical model of illness. The health beliefs held from this source are, therefore, scientific in nature and focus upon discovering the source of infection and implementing the treatment required to eradicate the infection. Curry et al's study (2002) into parents' beliefs about childhood ear infections, found that the respondents understood the nature and associated risks of the infection and both of these sets of beliefs corresponded to the current biomedical concepts. With regard to treatment, however, the respondents' beliefs incorporated a much wider social model of the infection, in which personal experience played a particularly important part. Helman (2001) also found, in a study of Vietnamese patients with diabetes, that they explained their illness in terms of the social context of their lives, and thus their beliefs often differed from their physicians.

The popular sector embraces this wider notion of the causes of illness that is more in keeping with the political economy and lifestyle models above. The health beliefs held from this source represent a consensus of the explanations of illness shared throughout an individual's social network. When Latino immigrants in the US were asked to explain the possible causes of their TB infection, their responses included a popularly held but scientifically unsound belief that drinking from the same water bottle was a possible cause of TB infection (Ailinger & Dear, 1997). Andrea at al's (2001) survey of student nurses in Italy also found that, despite their prospective role

as health information providers, their beliefs about tobacco smoking were generic and often drawn from unspecific sources of information. Hsu & Gallinagh (2001), moreover, state that health beliefs and health behaviours are influenced by many demographic variables, such as age, gender, education, economic status and living situations. In the Ponteland incident, views originating from the popular sector included beliefs that the water supply or local fast food outlets were possible causes of contamination (Interview 010).

The third source of beliefs, the traditional sector, is at first glance perhaps more relevant in a less literate society than that which exists in Ponteland. This sector encompasses oral traditions, folk healers and non-professional specialists. Although these beliefs might be considered to equate with 'old wives tales,' researchers have called for health professionals to understand and respect beliefs rooted in cultural traditions with which they are not familiar (Hsu & Gallinagh 2001, Helman 2001, Curry et al. 2002).

TB has a long history; there is evidence that mankind has suffered from tuberculosis for more than 5,000 years (Colston, 1995). It is, therefore, perhaps inevitable that the disease is "shrouded in folk-lore, fear and antiquity" (Colston, 1995). The various names by which the disease and its related infections have been known throughout the centuries give an indication of the fear, which surrounded the illness. Some of the these terms are given below –

Consumption	*- as victims were 'consumed' by the disease*
King's evil	*- at one time it was thought that the King's touch could cure the disease*
White Plague	*- because of the deathly pallor of the victims*
Pott's disease	*- tuberculosis of the spine, mentioned above*
Phthisis	*- the original Greek name for the disease, similar to consumption in its meaning of chronic wasting away*

Ailinger and Dear's research (1997) found that the participants belief systems were pluralistic in nature. Similarly, the beliefs held by the residents in Ponteland would, therefore, encompass all three sectors. The pluralistic nature of the beliefs held are also complimented by the wider movement in society away from a one-sided doctor and patient relationship to an equal partnership between the two parties (Neuberger

1999, Coulter 1999). This movement sometimes termed 'health consumerism' was also a factor in the sense of crisis experienced by the community.

1.6 Health consumerism

1.6.1 Patient or consumer?

The National Health Service (NHS), founded in 1948, was based upon the paternalistic medical model of healthcare prevailing at the time, whereby professionals made treatment and care decisions on behalf of their patients (Gann, 1995). During the 1960's and 1970's the rise of movements campaigning for the rights of women and the disabled, for example, illustrated a shift in society towards greater rights for the individual. This was mirrored in healthcare, with a move away from the passive role of the patient towards a partnership between patient and professional.

A presentation at a recent consumer health conference was entitled "the patient is dead – long live the consumer!" (Lowe,1999). Both the presentation and the conference subscribed to the view that the patient was indeed dead, individuals were no longer patients with all that the term implies but were now consumers of health care. The word patient is derived from the Latin 'patior' which means to suffer or bear. Consumer, on the other hand, is derived from the Latin 'sumere' which means to take up. Each term implies a very different type of activity. On the one side, there is an individual allowing the healthcare professional to take the active part and tell the user what to do (Neuberger, 1999). The paternalistic relationship inherent in this scenario is concurrent with the medical model of illness described previously. On the other side, there is an individual with access to information that enables them to weigh up risks and benefits, and to make informed choices between options in health care (Gann, 1995). In point of fact, in most instances, the reality lies somewhere between these two definitions. As Gann (1995) points out, most people regard themselves as patients when they are actually receiving professional health care, but are in reality consumers of health care almost every day. Tallis (1999) argues that the term consumer, and other similar terms such as client, customer or user, "erases something that lies at the heart of medicine: compassion and a relationship of trust." Lupton,

Donaldson & Lloyd (1991), suggest that patients implicit trust in doctors reduces their motivation to evaluate alternative points of view and moreover, contends that there are limiting factors to consumerist behaviour in relation to health care, such as the uncertainty of illness and an individual's access to relevant information.
Coulter, (1999) however, asserts that the relationship between doctor and patient should be based upon "mutual respect for each other's skills and competencies." She sees the patient and doctor in partnership and goes on to say that partnership has replaced consumerism. Mackay (2000) cites trends, such as increasing patient involvement in research and the growing recognition of patients as experts in the management of their own chronic diseases as evidence of an evolving patient – doctor relationship.
No matter which term is used, patient, consumer or partner it is evident that the exact nature of the relationship between the two parties is the subject of much debate, and open to a number of different interpretations from both parties. Given the mix of inhabitants in the Ponteland community, it is suggested that the residents held a correspondingly wide range of health beliefs during the incident.

1.7 Information

Information lies at the heart of the debate about the patient doctor relationship. In the paternalistic, medical model relationship patients are given information about their condition and treatment on a 'need to know' basis. An eminent physician in the late 1800's typifies this approach in his statement that " a patient should only get so much [truth] as is good for him" (Mackay 2000). In fact providing information to patients has been shown to have many benefits for both the patient and the doctor (Hampson, 1995). A review of studies (Ley, 1988) listed the following benefits:

1. Greater patient satisfaction
2. Better patient co-operation with treatment regimes
3. Reduced anxiety and distress
4. Quicker recovery from surgery
5. Shorter lengths of stay in hospital

It would, therefore, seem to be evident that a relationship in which information is available equally to both patient and doctor should be the ideal. However, it has also been argued (Carey, 1997) that encouraging patients to make life or death decisions is allowing clinicians to abdicate responsibility. Coulter (1999) also points out, that some patients may not want to have this role placed upon them, so it is important "to find ways of offering involvement that do not place an unwanted burden upon sick people." Despite reservations such as these, Neuberger (1993) appealed to health professionals to share the information they possess with their patients.

To some extent the problem is not so much sharing the information as communicating the information to the patient (Neuberger 1998, Ley 1988). Carey (1997) suggests that a failure to communicate effectively with patients reduces the choices available to the patient. Ley's (1988) review of research in this area identified three problems in communication with patients, namely –

1. Making the information to be communicated comprehensible
2. Finding ways to improve recall
3. Finding ways to encourage feedback

Beenstock's study (1998) identified overuse of technical language as a major barrier to understanding, whilst Heiberg (1995) considered that a preference for Latin and Greek in the medical language results in patients being kept out of any discussions. Street (1991) also found that particular types of patient e.g. upper middle class, more educated and middle aged were more likely to receive information from their doctor than other patients.

Health professionals are invariably the primary source of information for the majority of people so these issues represent a significant problem for both doctors and patients (Buckland, 1995 Solomon, 1996 Merry, 1997 MacDougall, 1999).

1.8 Consumer health information

1.8.1 An information megatrend

Increasingly, however, individuals are seeking information from a variety of other sources. Indeed the provision of health information has developed over recent decades into a specialism in its own right. Consumer health information (CHI) has developed rapidly since its beginnings in the United States in the 1980's. Gann (1995), one of the pioneers of CHI provision in the UK, describes Consumer Health Information as one of the information 'megatrends' of the 1990's. Stevens, Morris & Rolinson (1996) consider that there are two underlying causes for this trend; an increasing demand for health information from the general public, and government health policies requiring health authorities to respond to the needs of the public they serve. More recently Mackay (2000) identified the following three reasons as the most important contributory factors for the trend –

1. Increasing consumerism in society as a whole
2. A growth in awareness that the individual can do much to improve their own health
3. Increasing costs in health care provision.

The growth of CHI in the UK, however, has been stimulated by an increasing emphasis in Government policy upon consumer choice, which is related to the third of the reasons above. Self help and informed choice will, it is hoped, keep the costs of healthcare down (Coulter, 1999). Stevens, Morris & Rolinson (1996) noted that the Patients Charter, published in 1991, made the provision of health information to the general public not only desirable but also obligatory. Included in the patients rights enshrined in the Charter was the "right to be given a clear explanation of any treatment proposed, including any risks or alternatives" (DOH, 1991). By 1996, the provision of patient information was accepted to such an extent that a White Paper, Primary Care: Delivering the Future set out proposals for a national resource centre with the aim of " improving the NHS's capability, competence and capacity to provide good, evidence based patient information" (DOH, 1996). In 1997 the then Health Minister announcing the creation of this resource centre (the Centre for Health

Information Quality, ChiQ) talked about the "government's commitment to giving patients accurate and relevant information about health and health services" (Carey, 1997). Coulter (1999), moreover, noted that by 1999 the government was promising advice via telephone helplines, website links, health skills training programmes, and a new handbook of common ailments. The latest NHS plan, published in July 2000, and setting out the agenda for the next ten years promises " more power and information for patients" (DOH, 2000). So, despite the reservations expressed by Carey (1997) and Coulter (1999) previously, it is apparent that Government policy is, and will continue to be, firmly behind the consumer health information movement.
CHI, however, is more than just information to help people cope with being ill. In keeping with the social model of health, CHI includes information relating to prevention of illness as well as treatments and cures. Solomon (1996) identified that a significant proportion of consumers were interested in health promotion and lifestyle oriented information. In addition, current Government policy with respect to health has a distinct emphasis upon lifestyle choices. The latest NHS plan, (DOH, 2000) targets heart disease and cancer as priority issues. Both of these diseases emphasise lifestyle choices in prevention and treatment. Gann (1995) contends that having information is the first step to every healthy choice made, whilst Mackay (2000) states that the adequate provision of health information is a factor in empowering individuals to maintain good health. There are, however, some concerns about the provision of health information from both health and information professionals.

1.8.2 Sources of information

Consumers of health information have a wide variety of sources from which to select information on any given health topic (Charnock et al. 1999). Respondents in one study, for example, cited 22 different sources they accessed for information on rheumatoid arthritis and 32 different sources for information on the hazards of smoking (Solomon 1996). Buckland (1995) categorised the information sources into four main types:

1. Information provided as part of the process of medical treatment
2. Information services or helplines
3. Self-help information sources e.g. books or leaflets

4. Informal sources of information

A number of studies identify the GP as the foremost of three key sources of health information (Buckland 1995, Stevens, Morris & Rolinson 1996, Merry 1997). Buckland (1995), however, points out that reliance upon health professionals as the main, or only, source of information has many limitations. Gann (1996), for example, considers that "too often the information provided to consumers is process based rather than outcome based." Other concerns with too heavy a reliance upon the health professionals relate to the time available for discussion (Buckland 1995) and the problems already mentioned relating to doctor / patient communication (Ley 1988).
The media – television, magazines and newspapers – are the second key source of health information (Stevens, Morris & Rolinson 1996, Merry 1997, Mackay 2000). A study by Hampson, (1995) found that over half of the sample population accessed their information from magazines and newspapers. Research has also shown that a higher proportion of women (44%) than men (33%), of all ages, regard newspapers and magazines as an important source of health information (Merry 1997). Another study found, moreover, that men's magazines approach to the portrayal of health is much more reasoned and informative than that of women's magazines (Smith, C 1997). The same research project, however, highlighted the fact that magazines are "very reliant on PR (public relations) companies for the health information that they provide for their readers." There is, therefore, naturally some concern about the appropriateness and reliability of the information provided. Neuberger (1999) praises the "sterling work of health journalists" in presenting information from learned journals in a more readily accessible format. She does, however, acknowledge that they don't always get it right.
The third key source of health information for many individuals is friends and relatives (Buckland 1995, Hampson 1995, Mackay 2000). As Buckland (1995) points out, this is a popular source for many people as the barriers to the information are less, compared to other sources. Personal experience, a significant element of this source, is also a factor in the importance attributed to the information imparted this way. In common with the other sources mentioned above there are some concerns about the quality and accuracy of information received from friends and relatives (Buckland 1995).

Increasingly, a number of other sources of health information are gaining in popularity. Telephone help-lines, for example, exist for a variety of health topics such as cancer, meningitis and tobacco use. The proliferation of help-lines has been instrumental in identifying an increasing demand for preventative health information (Buckland 1995). In addition to help-lines providing information relating to specific conditions or health topics, NHS Direct, a national telephone help-line providing 24-hour access to a wide range of information and advice achieved nationwide coverage in 2000. Northumberland was one of the pilot sites for this service, but unfortunately, with regard to the TB incident, the service was not available at that time.

The advent of the Internet has had a major impact upon the provision of consumer health information. Patients now have access to a wealth of health information via this medium. A study in 1999 claimed that a quarter of all material available on the Internet is health related (Brown & Dickinson 1999). As well as a wide range of databases and directories, consumers are able to browse respected medical sources such as an on-line version of the British Medical Journal (Mackay 2000).

This medium is also accessible to sections of the population that historically have had difficulty accessing information from traditional sources e.g. disabled individuals and young people (NCDDR 1997). In relation to the TB incident, a quick search using 'tuberculosis' as the search term, retrieved a wealth of information including World Health Organisation statements about the rise in the incidence of the disease and information sheets for students who have recorded positive test results in screening programmes (WHO [n.d.], INH 1998).

Whilst there are many positive aspects to health information provision via the Internet, in common with all of the lay health sources mentioned previously, one of the major concerns health and information professionals have relates to the quality of the information provided by this medium.

1.8.3 Quality

1.8.3.1 Concerns

Solomon (1996) states that sources of lay health information vary from the reliable to the highly suspect in terms of authority, quality and extent. Whilst, Mackay (2000) noting the media as an important source of health information, also commented that

the quality of advice varies tremendously. More disturbingly, Kiley (1998) recounts a number of incidents concerning medical products available via the Internet that were at best misleading and at worst posed a significant health risk to consumers.
With regard to this last point, the Internet is most often held up for criticism relating to the quality of the health information provided. This may, however, be due as much to the enormous amount of health information available via this medium, (Brown & Dickinson 1999) as to the lack of quality controls for the information thus provided. Whilst critics single out the Internet as an unreliable source of health information (Coeira 1996), Due (1996) echoes the opinions of Mackay above in stating that the concerns relating to the quality of the information are equally applicable to information available from other sources.
Various authors have suggested criteria upon which the quality of the information should be judged. Gann (1998) states that the information should be clearly communicated, based upon good evidence and address the needs and priorities of patients. Milne, Booth-Clibborn & Oliver, (2000) moreover, state that all health information, including that for consumers, needs rigour or the information is inaccurate. Eysenbach, (2000) discussing health information available via the internet particularly, states that quality control rests upon 'four pillars' –

1. Educating the consumer
2. Encouraging the self regulation of providers of health information
3. Having third parties evaluate the information
4. Enforcing sanctions in cases of dissemination of fraudulent or harmful information

In response to the concerns voiced by the various authors a number of quality assessment initiatives have been instigated. The initiatives discussed below relate particularly to health information provision in the UK, but the situation is mirrored worldwide. Some of the initiatives mentioned were available at the time of the TB incident, OMNI, whilst others, DISCERN, were still under development at that time. These initiatives are, however, included as a representation of the issue, which they were developed to address.

1.8.3.2 OMNI

One of the early initiatives targeted at health professionals, but accessible by the public, was a project entitled Organising Medical Networked Information (OMNI). The aim of the project was to "build a gateway for the higher education and research community to facilitate local access to selected high quality information on the Internet about clinical, research and management aspects of health and biomedicine" (Merry 1997). Pealer and Dorman, (1997) are of the opinion that evaluating all health-related sites is an impossible task for reviewers. Subject gateways, like OMNI, that select and review specific types of resources are one way in which the wide variety of resources available via the Internet can be marshalled. Gateways differ from search engines, in that they "provide an organized access to *subject specific* information on the Internet" (Mackie & Burton, 1999).

The OMNI service is UK based, and provides comprehensive coverage of the UK resources in the specific areas, as well as access to the best resources worldwide (Welsh 1997). Although the main catalogue contained over 4000 records describing quality biomedical Internet based resources, the coverage was considered limited and uneven (Booth 2000a). A review of the service that highlighted a need for broader subject based coverage led to the development of a new service entitled BIOME. BIOME includes broader based material relating to all topics under the health and life sciences umbrella (Booth 2000a).

All of the material accessed via the gateway is assessed in relation to specific quality and relevance criteria. Librarians and academics specify these criteria, and this human input is also a distinguishing feature of subject gateways (Mackie & Burton, 1999). Prospective resources are evaluated with regard to a number of criteria, such as-

1. Accuracy
2. Availability
3. Currency
4. Frequency of updating
5. Design
6. Ease of access
7. Intended audience
8. Reputation of provider
9. Responsibility for maintenance

This initiative, therefore, rests firmly upon the third of Eysenbach's pillars of quality control described above.

1.8.3.3 DISCERN

Whilst OMNI is a gateway for access to a range of quality assessed health information resources for both professional and non-professional readers, DISCERN, on the other hand was designed specifically to:

1. Enable information providers and patients to judge the quality of written information about treatment choices
2. Facilitate the production of high quality evidence-based consumer health information by setting standards (Charnock et al 1999).

The assessment instrument, funded by a grant from the British Library and the NHS Executive Anglia and Oxford, was developed in two stages. The first stage was development and testing of the assessment instrument by an expert panel, which was followed by further testing of the instrument by a national sample of health information providers and self help group members. The instrument was designed to assess whether information provided was accurate and informative, as it was the opinion of the researchers that this was not always the case, even when information was well written and comprehensible (Charnock et al 1999). The instrument itself consists of a series of questions that the reader should pose of any written consumer health information on treatment choices. Each question is rated on a scale of 1 to 5 and hints are provided to guide the assessment. The areas covered by the assessment are:

1. Bias in the material
2. The statement of aims
3. References and additional sources of support
4. Uncertainty
5. Risks and benefits
6. Treatment options (Shepperd, Charnock & Gann 1999).

The aims of this initiative, thus, rest firmly upon the first and second of Eysenbach's four pillars of quality control.

1.8.3.4 Official Bodies

With respect to the fourth pillar of quality control, enforcing sanctions in cases of dissemination of fraudulent or harmful information, to date no official body performs this role. In this respect, health information for consumers is governed by the same regulations as that pertaining to any form of advertising or promotion. In fact, a current European Union project, medCERTAIN, is based upon the notion that,

> *"The quality of health information and interactive applications on the internet should not be controlled by a central body or authority, but instead must be evaluated and labelled by medical societies, professionals or consumer organisations."* (Eysenbach, 2000)

There are, however, centrally funded agencies, such as NHS Direct and the Centre for Health Information Quality (ChiQ), that provide and evaluate consumer health information in the UK. Both of these services are concerned with the provision of high quality consumer health information, although neither perform any regulatory function. NHSDirect and the related service, NHSDirect Online, are a telephone help-line and an internet based provider, respectively, of accredited information and advice to the general public. ChiQ, on the other hand, works with information producers and providers to raise standards in consumer health information (ChiQ, 2000). ChiQ used the DISCERN appraisal instrument to assess material for inclusion in the NHSDirect Online service. The Centre, has also recently launched a website, HiQuality, (http://www.hiquality.org.uk) that offers the public "a resource for checking the quality of health information" (ChiQ press release, 12/03/02).

It is apparent, from the above, that the quality of consumer health information is of great concern to information providers. The measures, however, taken to overcome these concerns are only able to provide assessment and guidance for a limited range of the resources available to the consumer. With regard to Eysenbach's four pillars of control, therefore, it would seem that whilst the current emphasis is upon placing reliance on the third pillar, self regulation, there remains a great deal of work yet to be

done in the whole area of quality control in relation to consumer health information for this reliance to be considered well placed.

1.9 Conclusion

The suspected TB incident in Ponteland occurred within the context of a changing health environment. These changes affected both the individual receiving, or accessing, health care, and the individual, or body, providing access to healthcare. The nature of this changing environment was reflected in the attitudes and concerns of both the residents in the community and the health professionals managing the incident. Whilst the specific details of the incident occurring in Ponteland were unique, the underlying issues, such as the relationship between doctor and patient, the notion of health consumerism and the quality of health information available to the general public, are part of debates already taking place in the wider field of health communication and health information provision.

The health environment in which the incident occurred is, however, only part of the picture. This research project considers a medical incident from an information studies perspective, thus incorporating another context within which the research is placed. In addition, the very nature of the research conducted for this project is itself part of a wider landscape covering a multitude of disciplines. These wider perspectives are considered in the following chapters of this thesis to provide the reader with an overview of the prevailing issues applying both at the time of the incident and throughout the lifecycle of the project.

2.1 Introduction

This research project embraces diverse research foci. The nature of the crisis facing the community, a suspected TB infection, immediately places the study in the broad field of health research, however the focus of the study, the dissemination of information about the suspected TB infection, places the study in the narrower field of health information research.

This study is, moreover, concerned with both the provision and receipt of information. The main research area of this project therefore, and one aspect of the originality of the project, is information behaviour research. Considering a health crisis from an information behaviour perspective is one of the original elements of this study. Whilst research projects have considered crises from a variety of perspectives (Round & Palmer 1998, MacLehose et al 2001, Pijnenburg & van Duin 1990) only one has previously considered the dissemination of information during an emergency (Killick & Murty 1996), but the focus of this study was upon the assessment of recipient's knowledge levels, in relation to the various dissemination methods used. To date, no studies have considered the dissemination of information during a crisis from an information behaviour perspective, and incorporated the views of both the information providers and the information recipients in the consideration.

In addition to information behaviour research there are a number of other research areas from which this study will borrow. The first of these areas relates to the *process* of information dissemination. The provision and dissemination of products, or services, is a distinct area of research. Diffusion research, as it is known, has a history stretching back over fifty years. The focus of diffusion research is upon studying the spread of innovations, or ideas, through formal and informal networks.

This project will also borrow from research conducted in the field of risk communication research. The health professionals managing the crisis were involved in the assessment and communication of risk, relating to the possible spread of a highly infectious disease.

The final area of research to which this project relates is as a result of the form that the research itself takes, rather than in relation to either the nature of the topic, or the process of information provision and receipt. One of the research aims for this project

was to evaluate the dissemination of information during the crisis. Evaluation research is a specific research area with its own traditions and research norms, within which this research will be conducted.

2.2 Diffusion research

2.2.1 Definition

Definitions of dissemination are numerous and varied although the term is most generally used to refer to the transfer of knowledge. Distinctions are, however, sometimes drawn between the spontaneous, unplanned spread of ideas or knowledge, often termed diffusion, and the deliberate, planned spread of knowledge, often then termed dissemination (Basch, Eveland & Portnoy 1986, Crosswaite & Curtice, 1994). Lomas, (1993) for example, distinguished between diffusion as a passive process and dissemination as an active process. Steckler (1992) defined diffusion as the process of change over time and dissemination as the actions taken to facilitate the diffusion of innovations. King, Hawe & Wise (1998) identified five steps in the process of transferring knowledge about a new health promotion programme-

1. Communicating information about a new programme
2. Persuading others about the relevance and applicability of the programme
3. A decision by others to adopt the new programme
4. Changing work practices so as to implement the new programme
5. Sustaining the changed practices.

They noted that some authors used the term diffusion to refer to all of the five steps listed, and the term dissemination to refer to steps one and two only. Sharp and McLaughlin (1997) identified a similar hierarchy of meanings for the term dissemination. They distinguished between the activities performed by the recipient of the information at each level of dissemination. Thus,

At level 1 the recipient is aware that a project or development work is taking place

At level 2	the recipient has received some or all of the materials resulting from the project
At level 3	the recipient has attended a conference, workshop, seminar or other event mounted by the project
At level 4	the recipient has made use of the project materials in his/her own work
At level 5	the recipient has distributed materials to colleagues in his/her own workplace
At level 6	the recipient has distributed materials to colleagues in other organisations

Winn (1987) also used the term dissemination but again, differentiated between planned dissemination and, what she called the normal everyday process of dissemination. Planned dissemination is the delivery to a target group of people, by other members of a field, information relating to and intended to bring about, a certain kind of innovation. Everyday dissemination, on the other hand, occurs when individuals actively seek out information on topics of interest to them, or which they feel they need for immediate tasks, and pass on to others information they think may be of interest or use.

Friedman and Farag (1991) were unable to locate a comprehensive, commonly accepted definition of dissemination and conclude therefore, "the dissemination nomenclature depends on the discipline." Social scientists, for example, define dissemination as the production of new knowledge in others (Winn 1987), whilst a report for health services managers defines dissemination as being "not just about the diffusion or distribution of information, but its application or implementation" (Appleby, Walshe & Ham, 1995). In 1986 Chatman wrote that diffusion theory was "relatively new to the field of library and information science, [as it] had been essentially used to examine the spread of *things*" (Chatman, 1986). Researchers in information studies generally consider the spread of information or knowledge in their studies, which is an abstract concept compared to the activities studied by diffusion researchers. The term dissemination, which relates to passing on information, or references, about current material to interested individuals has, on the other hand, been widely used over many years in the field of library and information science. Rogers, (1995) whose work underpins much of the research in the area of diffusion research encompasses both the planned, systematic process of information transfer

and the passive, unplanned process of knowledge diffusion in his use of the term diffusion. Rogers defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. An innovation, in this context, can be an idea, practice or object that is perceived as new by an individual.

As dissemination is the more widely recognised and used of the two terms in information studies it is, therefore, the preferred term for this specific research project. Dissemination in the context of this project encompasses both the systematic and unplanned aspects of the process. Systematic elements of the dissemination process during the suspected TB incident included the distribution of newsletters compiled by experts to the local community. Initially the newsletters were distributed via school children attending local schools, but latterly were also disseminated through specific information points in the community. The unplanned element of the process during the incident, on the other hand, incorporates the informal communication relating to the incident that occurred within the community. As was noted in the previous chapter, friends and relatives are one of three key sources of health information (Buckland 1995, Hampson 1995, Mackay 2000). Communication with these individuals during the incident would have been conducted outside of the systematic information distribution. This project aims to study both the systematic and unplanned elements of information distribution during the suspected TB incident.

2.2.2 History

Rogers (1995) credits Gabriel Tarde, one of the forefathers of sociology and social psychology, as being the first dissemination researcher. At the turn of the century Tarde sought to discover why of the one hundred different innovations conceived at the same time, ten will spread whilst ninety will be forgotten. Since Tarde's study dissemination research has been conducted under the auspices of a variety of disciplines. Gatowski et al (1997) identified eight different perspectives for the research, whilst Rogers (1995) numbered eighteen research traditions, ten of which he suggests represent the greatest number of empirical diffusion publications. The ten research traditions are: -

1. Anthropology
2. Early sociology
3. Rural sociology
4. Education
5. Public health and medical sociology
6. Communication
7. Marketing and management
8. Geography
9. General sociology
10. Economics.

Studies conducted within each tradition considered different types of innovation and used a variety of methods to gather the data. The contributions each tradition makes to the discipline of dissemination research are, therefore, correspondingly diverse.

2.2.3 Research

2.2.3.1 Hybrid corn

Ryan and Gross' study (1943) of the diffusion of hybrid seed corn in two Iowa communities is one of the seminal studies of diffusion/dissemination research. Their project was conducted to study the factors relating to adoption of the innovative seed corn in the two farming communities. Hybrid corn was a high yielding, drought resistant corn developed by scientists at the state university. The two researchers interviewed over three hundred farmers and found that "diffusion agencies were divisible into two different types" (Ryan & Gross 1943). In the farming communities, salesmen were the major source of introductory information, but the demonstrated success by neighbours within the community counted for more, in terms of adoption of the innovative corn seed. Almost half of the farmers in the study stated that their earliest source of information about the seed was from personal contact with the salesmen. When asked to evaluate the various sources of information, however, almost half of the farmers stated that their neighbours were the most influential in leading them to adopt the hybrid corn. Ryan and Gross plotted these responses according to the year that the respondent adopted the new corn. The resulting graph

highlighted that two-thirds of the early adopters credited salesmen with influencing them the most, whilst two-thirds of the latest adopters were most influenced by their neighbours (Ryan & Gross, 1943). From their study Ryan and Gross inferred that salesmen were credited with *informing* the majority of the operators, but neighbours were credited with *convincing* them.

2.2.3.2 Modern math

In 1965, a research project in educational research made another significant contribution to the development of diffusion research (Carlson, 1965). The study of the diffusion of modern math, a new approach to teaching mathematics, in Pittsburgh employed the same method of data collection, personal interviews, as Ryan and Gross. The modern math research however, unlike the hybrid corn study, included details of communication patterns among the school superintendents in Pennsylvania and West Virginia. Analysis of the data collected on this aspect of the diffusion process, enabled Carlson (1965) to identify six superintendents (opinion leaders) who performed a crucial role in the overall adoption of the innovation. Surprisingly for the researchers, the first school superintendent in Pennsylvania to adopt the modern math system was not one of the six opinion leaders. This individual, although innovative and an early adopter, both characteristics of opinion leaders, did not, however, share interpersonal links with any of the other school superintendents (Rogers, 1995). The contribution this study made to the research field, was thus the identification of the role of opinion leaders in social networks in the diffusion process.

2.2.3.3 Antibiotics

A year later, a public health research project studying the adoption of a new antibiotic among doctors in Illinois, illuminated the importance of opinion leaders in the diffusion process (Rogers, 1995). This project, by Columbia University researchers, is considered to be perhaps second only to the Ryan and Gross analysis of hybrid corn, in terms of its' contribution to the diffusion research paradigm (Rogers, 1995). The project was the first to consider the *nature* of diffusion networks. Opinion leaders

were defined in the study as individuals who had been identified as a social friend by three or more of the study participants. The researchers discovered that these individuals were, in virtually all instances, early adopters of the new antibiotic. Furthermore, the rate of adoption amongst all of the participants accelerated rapidly once these opinion leaders transmitted their favourable stance. The researchers identified seven variables relating to the diffusion network, which they discovered were better predictors of innovativeness than external variables, such as income or exposure to the information (Rogers, 1995). These diffusion network variables were:

1. Affiliation with a hospital as a regular staff member
2. More frequent attendance at hospital staff meetings
3. Sharing an office with one or more doctors
4. Being named socio-metrically as a source of information and advice by other doctors
5. Being named socio-metrically by other doctors as someone with whom they discussed their patients' cases
6. Being named socio-metrically as a best friend by other doctors
7. Reciprocating the socio-metric network links reported by other doctors who chose a respondent as a discussion partner.

This study not only reinforced the findings of Ryan and Gross but also, for the first time, identified the attributes of potential opinion leaders.

2.2.3.4 Diffusion in health care

A few years after the Columbia University study dissemination research entered a new field. In the 1970's Kotler coined the term 'social marketing' for an emerging area of information dissemination campaigns (CSM, [n.d]). Social marketing applies a marketing approach to social concepts (Rice & Atkin, 1994). Social marketing campaigns, therefore contain the following elements (CSM, [n.d]):

1. A consumer orientation
2. An exchange
3. A long-term planning approach.

Evaluation of a campaign is an important element of the long-term planning approach, which is central to social marketing. This aspect of social marketing, coupled with an emphasis upon disease prevention and health promotion, has resulted in an increase in the number of dissemination research studies conducted in the public health field (Basch, Eveland & Portnoy 1986, Parcel et al. 1989, Steckler 1992, Congelosi & Markham 1994). In recent years, a movement within health care towards evidence-based practice has added further impetus to the increase in the number of studies being conducted (Martin et al, 1998). In 1995, a report calling for more research into the dissemination and implementation of research findings, noted that the topic had been made a priority within the national NHS research and development programme (Appleby, Walshe & Ham, 1995). Despite this drive to conduct more research in the area of dissemination in health care, the results of the studies conducted have not provided any new insights for practitioners in the field. Freemantle and Watt (1994), for example, were disappointed to note " clear evidence that merely publishing research in grey literature reports, and in the pages of even the most prestigious clinical journals, does little to change practice among professionals." Whilst, Mesters and Meertens (1999) echo the findings of Ryan and Gross over fifty years earlier, in their assertion that once adoption has occurred then the more visible the positive results are to others, the more communication about the product is stimulated, which will promote greater adoption and diffusion of the innovation.

2.2.4 Opinion leaders

Rogers (1995) defines diffusion as a process, by which an innovation is communicated through certain channels over time among the members of a social system. As the studies outlined above have demonstrated, some members of the social system have a more important role to play in the diffusion of an innovation than others. These individuals are the opinion leaders in the social networks. Freimuth (1987) considers that "opinion leaders [fulfil] an informal position in the social system, that is earned and maintained by technical competence, social accessibility and conformity to the system's norms."

Bandura's social learning theory (1986) suggests that the opinion leaders role in the dissemination of information is to 'model' the new attitude or behaviour. Social learning theory differentiates between the acquisition of knowledge about an innovation and the adoption of an innovation (Bandura, 1986). In the Ryan and Goss study (1943) the farmers acquired knowledge about the new seed corn from salesmen, but their decision to adopt the new seed was based upon the modelled behaviour of the early adopters. The modern maths study also demonstrated however, that "the opinions and behaviour of those who possess status and prestige are likely to have a greater impact upon what spreads through a social network, than the activities modelled by peripheral members" (Bandura, 1986).

Individuals may be members of a number of social networks through, for example, work, leisure or community activities. In addition, an individual's role may be different in each network; they may be opinion leaders in one network and peripheral in another. Again, in the modern maths study, the initial adopter, who was peripheral in the network of Pennsylvania school superintendents may well have been an opinion leader and influential in an entirely separate social network. As Crosswaite and Curtice (1994) note the "task of targeting opinion leaders may not always be straightforward."

An aspect of social networks, which is particularly relevant to the role of opinion leaders in the diffusion of innovations, is homophily. Homophily is "the degree to which a pair of individuals who communicate are similar" (Rogers, 1995). Similar, in this instance, relates to social status, attitudes, beliefs and values. In the Illinois doctors study, the opinion leaders were those individuals who had been identified as a social friend by three or more of the study respondents. In identifying the individuals as friends it is suggested that the respondents shared similar status, attitudes and beliefs. The opposite of homophily is heterophily, "the degree to which pairs of individuals who interact are different in certain attributes" (Rogers, 1995). Effective communication between heterophilous individuals requires considerable effort from both parties, the so-called 'generation gap', for example, could be due to the heterophilous nature of communication between teenagers and parents. This particular aspect of opinion leadership and communication is especially relevant to the suspected TB incident, where information was provided by professional adults, but the individuals at the heart of the incident were young children.

2.2.5 The media

The hybrid corn study (Ryan & Gross, 1943) highlighted that different communication channels performed different functions in the diffusion process. The farmers in the study were *informed* about the hybrid corn by one source of information but *convinced* to adopt the innovation by another source. Freimuth (1987) states that the "primary function of the mass media is to create awareness and reinforce existing behaviour, whereas interpersonal sources can influence change." Rogers (1995) also asserts that mass media channels are relatively more important at the knowledge stage of the diffusion process, whilst interpersonal channels are relatively more important at the persuasion stage in the innovation – decision process. He does acknowledge, however, that this assertion presupposes access to mass media channels similar to those existing in the United States. Research in Namibia (Jalloh, 1998), for example, found that "most of the information dissemination through print, audiovisual media, radio and mass media is either not reaching the majority of the population or nothing is being communicated at all." The same study also found " an over-emphasis on print as a medium of communication despite the low literacy levels especially in the rural areas where the bulk of the population reside" (Jalloh, 1998). In societies such as Namibia interpersonal sources assume a greater level of importance in *informing* individuals or groups.

Bandura (1994) however contends that, "neither informativeness, credibility nor persuasiveness are uniquely tied to interpersonal sources or to media sources." The use of each source depends not only upon the ease with which it can be accessed, as Rogers (1995) acknowledges, but also "the likelihood that it [the source] will provide the kind of information sought" (Bandura, 1986). Social cognitive theory also contends that, "modelling serves as the major vehicle for transmitting information about new styles of behaviour and their likely effects" (Bandura, 1986). The mass media with its ease of access and its ability to supply its audience with a wide range of vicarious knowledge and experiences is therefore a potentially potent transmitter of information.

In a health context the mass media have been criticized for portraying "a wide variety of unhealthy behaviours, incorrect medical information and antisocial attitudes" (Rice & Atkin, 1994). It should also be noted that in the press particularly "information must be tightly packaged, which often results in oversimplification" (Freimuth, 1987).

In the suspected TB incident, a number of press articles about the incident appeared in both the local and national press as well as news items in local and national television coverage. Press coverage at the end of the incident frequently reproduced information given in a report made by the health professionals managing the incident to the local Borough Council, (Black 1998). The sentence in the report "this presents a conundrum, the pool has already been 'fingered' therefore to do nothing is difficult", for example, was taken directly from the report and reproduced exactly in a press article (Harte, 1998). This is in contrast with an earlier press article (Allison, 1998) published on the same day as a newsletter was issued to the community (TB update, 11/02/98). Again the press article reproduced information given in the newsletter, stating that "the positive tests could be the result of an infection by a TB organism that is not the disease, or a childhood virus that could have interfered with the TB skin test and possibly produced a false positive. Another theory is they have been infected by an animal..." This information appeared in the newsletter as "other possibilities [for what the tests represent] include:

a. A non-human (animal) source of TB (very unlikely)
b. Infection with a similar species of organism ("atypical mycobacteria")
c. Some other cause of false positive skin test reaction possibly or common childhood viral infection (this is a theoretical possibility without any evidence). This also seems very unlikely to us" (TB update, 11/02/98)

Although the wording in the two items is similar, the experts risk assessment of the possible causes of the positive test results is omitted from the press article. In addition the press article described the health professionals managing the incident as "baffled doctors" and the children involved in the incident as "not even suffering from TB but some completely different ailment" (Allison, 1998).

Thus whilst the mass media are credited with creating awareness and informing their audience, media coverage such as the above, and discrepancies between expert and lay assessments of risk, suggest that this process, in situations such as the suspected TB incident, is not straightforward. Consideration of this aspect of information provision is the subject of study in the second of the research areas related to this project, risk communication.

2.3 **Risk communication**

2.3.1 Background

Although risk communication has been practiced for thousands of years e.g. soothsayers in ancient civilizations, (Perrow, 1984) the study of risk communication as a distinct social phenomena is relatively new (Krimsky & Plough, 1988). The study of this phenomena includes a number of research areas within its broad remit. Depending upon the particular focus of the research, projects have included aspects of social and cognitive psychology, (Broadbent 1985, Slovic 1986, Barnett & Breakwell 2001) engineering, (Kasperson et al.1988) linguistics (Fischhoff, Slovic & Lichtenstein, 1982) and anthropology (Douglas & Wildavsky, 1982). With such wide ranging areas of research, definitions of risk communication are inevitably vague or all-encompassing. Dunwoody and Neuwirth (1991), for example, define the practice of risk communication as "the relaying of any interpersonal or mediated message that contains information about the existence, nature, severity or acceptability of a risk". Covello, von Winterfeldt & Slovic (1986), however, more specifically define risk communication as:

> "The act of conveying or transmitting information between interested parties about a) levels of health or environmental risks; b) the significance or meaning of health or environmental risks; or c) decisions, action or policies aimed at managing or controlling health or environmental risks. Interested parties can include government agencies, corporations and industry groups, unions, the media, scientists, professional organizations, public interest groups and individual citizens."

It is apparent from both of these definitions that the health professionals, other professional parties and the community of Ponteland were involved in the communication of risks about, initially, the threat of TB infection, then later the impact of six months medication and the risks relating to the possible source of the unspecified infection.

2.3.2 Risk interpretation

2.3.2.1 Expert or layperson

It is not unusual to hear it lamented that science and technology is progressing so rapidly that the general public has difficulty keeping abreast of the latest developments. In particular, concerns are frequently raised about the risks associated with the introduction of new technologies. These concerns are not, however, new. As Friedman (1991) points out "people began to question whether science's ability to produce new discoveries was outstripping society's ability to control them in the late 1960's and early 1970's".

It has been well documented in risk communication studies that the interpretation of risk from a laypersons perspective is fundamentally different from that of an expert (Krimsky & Plough, 1988, Friedman 1991, Renn 1992, Thompson & Dean, 1996). At the heart of this divergence of opinion lies the distinction between a scientific concept of risk and a socially constructed definition of risk. Slovic, Fischhoff & Lichenstein (1985), for example, found that the public perceived nuclear power to be extremely risky and unacceptable, whereas experts considered nuclear power to be moderately risky but acceptable in the light of its benefits to society. A comparative study of Kenyan and Swedish teenagers also found that despite "HIV/AIDS being a much greater problem in Kenya than in Sweden ... more than two thirds of the respondents in the two studied populations were afraid of contracting HIV/AIDS" (Eriksson, Sonesson & Isacsson, 1997).

Sandman (1987), moreover, notes risk means expected annual mortality to experts, but to the public risk means much more. Krimsky and Plough (1988) identified these disparate interpretations as that of a technical model adopted by scientific experts, and a cultural model adopted by a non-scientific audience. Thompson and Dean (1996), moreover, related these different perspectives to a positivist definition of risk, a purely scientific concept that can be characterized and analysed through data collection and quantitative measurement, and a relativist definition of risk, a purely subjective reaction to phenomena encountered in personal or social experience. Renn (1992), however, contends that these definitions represent two extreme views and that reality lies somewhere between the two positions.

Dunwoody and Neuwirth (1991), moreover, also related the differences in interpretation to bias within the communication process. They consider that communication from a sender-based perspective assumes a knowledge deficit on the part of the receiver, and actively tries to reduce this deficit. Communication from a receiver-based perspective, on the other hand, examines the effects of the communication, as well as the process by which individuals select and use the available information.

2.3.2.2 Perspectives

Renn (1992) identified five different perspectives on risk:

1. Technical
2. Economic
3. Psychological
4. Sociological
5. Cultural

Each perspective provides a different conceptualisation of three elements of risk; undesirable outcomes, possibility of occurrence and the state of reality (Renn 1992). One approach to risk, which is part of the technical perspective, is an epidemiological assessment of risk. This technical perspective was particularly evident during the suspected TB incident. Decisions made with regard to the testing of pre school-age children, for example, were based upon the possibility of scientific assessment of the risk of these children having been exposed to the TB virus (TB update 25/02/98). This technical perspective has been criticised, however, as representing too narrow a framework for risk assessment (Renn 1992, Kasperson et al., 1988).
The psychological perspective is the predominant perspective in research on risk analysis, and the individual's perception of risk (Clarke, 1988). Research within this perspective has identified a number of risk characteristics that have been described as "strong and reliable predictors of judgements of risk" (Barnett and Breakwell, 2001). Factors, which have been shown to increase public concern about an issue, include a high level of media concern, children specifically at risk, involuntary and

uncontrollable exposure to the risk, scientific uncertainty of the risks and the grouping of fatalities or injuries in time and space (Hendee 1995, Clarke 1988). Although there were no fatalities or injuries in the suspected TB incident, the affected individuals were grouped in time and space and all of the other factors above were applicable to the situation experienced by the community. Previous research, therefore, suggests that individually within the community, members would have had a high perception of being at risk (Slovic, Fischhoff & Lichenstein, 1985). The focus, within this perspective, upon the individual perception of risk is, however, its main weakness (Plough & Krimsky, 1987). Renn (1992), for example, considers that this aspect limits the comprehensiveness and applicability of research conducted from this perspective. Clarke (1988) also argues that considering risk from an individual perspective "neglects the role of organizations in determining what is an acceptable risk." Clarke (1988), therefore, asserts that sociology can make significant contributions to the analysis of acceptable risk." The sociological perspective on risk is characterized by a diverse array of research foci. Renn (1992) even considers that "any attempt to classify these studies and link them to underlying theoretical concepts is like trying to find order in chaos." Echoing Clarke's assertion, however, Short (1984) contends that the main focus of sociologists in the area of risk communication should be upon what makes risks acceptable, the 'bottom line' as he terms it. From this standpoint the sociological perspective considers concepts such as equity, fairness and flexibility in the analysis and communication of risk (Renn 1992). Short (1984) adds confidence, trust and responsibility to this list. Krimsky and Plough's (1988) studies of the communication of risk regarding environmental hazards were conducted from a sociological perspective. They examined "the assessment, interpretation, communication and response to particular environmental risk events in their social context to obtain a full accounting of the factors involved." In the analysis of the five case studies they conducted it became apparent that "technical information did not play a dominant role in a risk communication controversy."

With respect to the issues of trust and confidence, Krimsky and Plough also found that their case studies suggested "visible and independent scientific validation of the technical decisions supporting risk communication were important."

In the suspected TB incident, the health professionals advised the community on a number of occasions that advice was being taken from national experts (TB updates 04/02/98, 23/03/98 03/06/98). A lack of trust, on the other hand, may be due to the

public's prior experience with an organization, or other source of information (Gutteling 2001). In Fox and Irwin's opinion (1998), moreover, in risk communication often the information provider and the recipient "neither understand nor trust each other."

In the suspected TB incident, the introduction of uncertainty relating to the source of the positive test results led, in some instances, to a lack of trust within the community with the health professionals managing the incident. Press reports quoting parents illustrate this (Allison, 1998).

> "they unnecessarily worried people"
>
> "we were told not to worry, now we don't know what is happening and wonder what we don't know"
>
> "we were happy with the way things were being handled up to a couple of days ago but now we don't know what's going on and are beginning to wonder if they're not telling us something"

Whilst the sociological perspective addresses issues, such as trust, ignored by the technical, economic and psychological perspectives, criticisms of the perspective are still made. One of the most prominent criticisms relates to the prolifery of schools of thought within the broad perspective. Renn (1992), for example, contends that the "outcome of a sociological analysis is at least partially predetermined by the theoretical concept on which the analysis is based."
According to Douglas and Wildavsky (1982) between "private, subjective perception and public, physical science there lies culture, a middle area of shared beliefs and values." The cultural perspective "assumes that cultural patterns structure the mind set of individuals and social organizations to adopt certain values and reject others" (Renn 1992). Douglas and Wildavsky (1982), for example, are of the view that risk statements are a reflection of deep seated culture, an individual's statements or beliefs about risk indicates their place within society.

Proponents of the cultural perspective have identified types of cultural patterns, and groups within them (Douglas & Wildavsky 1982, Renn, 1992). Douglas and Wildavsky (1982) identified the centre and the border as a pattern of culture and market individualism, hierarchy and sectarian as groups within these patterns. Other authors have identified different patterns and groups to which organizations belong, such as:

Egalitarian	emphasize co-operation and equality, focus on long-term effects of human activities
Entrepreneurs	would like the government to refrain from extensive regulation or risk management efforts
Bureaucrats	believe in the effectiveness of organisational skills and practises
Atomized Individuals	trust only themselves and oppose any risk that they feel is imposed on them
Autonomous Individuals	are potential mediators in risk conflicts (Renn, 1992)

Individuals belonging to a particular group, it is proposed, share therefore similar perceptions of risk.

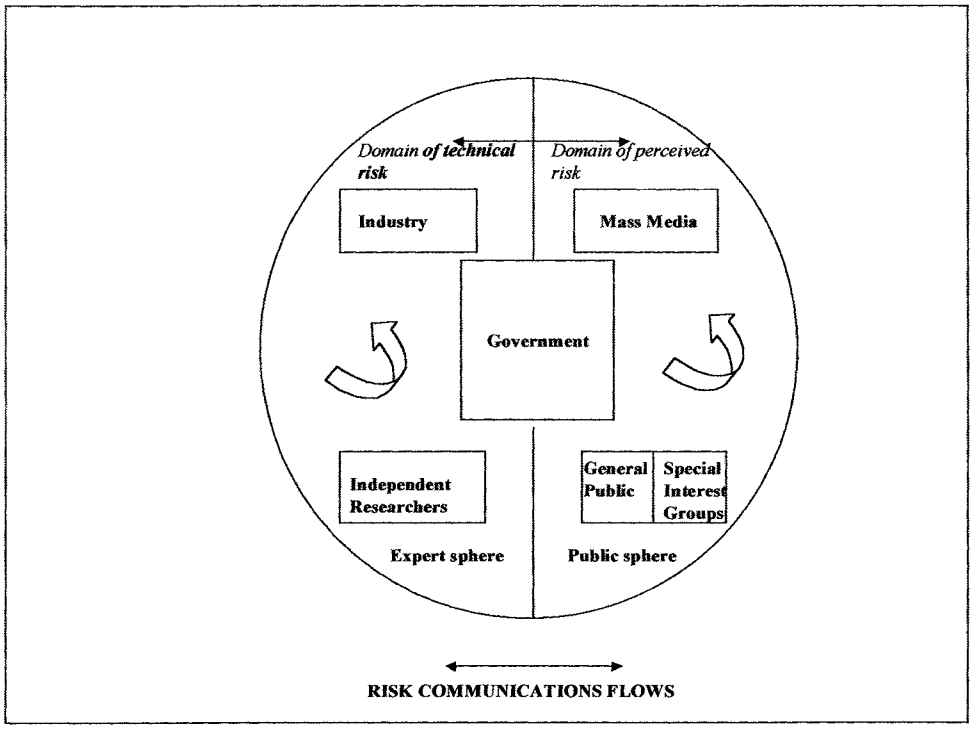
Research by Slovic, Fischhoff & Lichtenstein (1985) from the psychological perspective asked members of particular groups to rate specific risks. These groups included members of the League of Women Voters and members of a community service organization. From the cultural perspective the members of these groups could be classified as bureaucrats and egalitarians. It is, therefore, suggested that each group would have different perceptions of risk.

In Slovic, Fischhoff & Lichtenstein's study (1985) the League of women voters group rated nuclear power much more risky than did the members of the community service organisation. Both groups, however, judged handguns, smoking, motor vehicles and alcohol as relatively high in risk. These findings would indicate that the tenets of the cultural perspective are not a universally appropriate medium for the analysis of risk interpretations. The perspective does, though, represent a positive contribution to the study of risk communication in its acknowledgement of and emphasis upon values

and worldviews. Renn (1992) contends "what people and organizations perceive as undesirable events reflects their perception and evaluation of the cultural definition of the social context and its relevance for their worldview."

2.3.3 The media

Leiss and Krewski (1989) describe the media as "an active player in the dynamic tension of risk communication processes." In their Communications Processes Model (See Figure 1) they suggest that risk communication flows both within and between two domains, technical risk and perceived risk. They however state that most problems occur in the communication between the two domains i.e. between the expert sphere and the media / general public. In Leiss and Krewski's Model the media "neither generate, mitigate nor manage risks" and operate along with the general public in the perceived risk domain (Leiss & Krewski, 1989).



(Figure 1 taken from Leiss & Krewski, 1989)

The relative importance of the media in communicating risk information is the subject of some dispute amongst authors. Leiss and Krewski (1989) contend, and their model illustrates, that "only a small portion of all risk communications pass through the media." Covello, (1989) however, asserts that the "media play a critical role in transmitting information about the risks of chemicals, radiation and other toxic substances." Whilst Einsiedel (1989) states that the mass media "play a rather significant role in public perceptions of risk." These assertions would appear to be substantiated by the placing of the media by studies as the second key source of health information for consumers (Stevens, Morris & Rolinson 1996, Merry 1997, Mackay 2000). Krimsky and Plough (1988) moreover argue that the media "highlight existing uncertainties, dissonances and conflicts [and] are a great equalizer of perspective on risk" and Short (1984) declares that the mass media "play an important role in conflicts over risk." This is perhaps the most important function of the media in relation to the communication of risk.

As discussed previously there are a number of possible perspectives on risk that individuals might subscribe to. Logan (1991) considers the role of the media in relation to health issues "as literally popularising, or translating biomedical developments." This role involves translation of risk information from the purely technical risk assessment of experts to the broader perspectives of risk interpretation encompassed by the various approaches outlined above. This role is echoed in Neuberger's (1999) praise for health journalists "sterling work" in presenting information from learned journals in a more readily accessible format.

Viewed in this light the role of the media in risk communication is similar to their role in the diffusion of innovations, where their function is seen as informing their audience about the innovation, whilst interpersonal sources convince the audience to adopt the innovation. (See Section 2.2.3.1)

However there have been a number of criticisms levelled at media coverage of risk assessments, and indeed writers have gone as far as to blame the media for what they see as "public over-reaction to risk" (Slovic, 1986). The media have also been criticized for "selective and biased reporting that tends to emphasise drama, conflict, expert disagreements and uncertainties" (Covello, 1989). Logan (1991) notes that "journalistic attention to a disease varies according to the significance of its perceived threat to public health." Thus, a few years ago, incidences of measles in young children would have occurred without any particular media interest, however with the

recent controversy over possible side-effects of the Measles, Mumps and Rubella immunisation programme, incidences of measles infection now attract press attention. In addition the "dramatic event which receives extensive media coverage is likely to seem more 'risky' to consumers of media, while common, everyday hazards appear less frightening and are as a result underestimated" (Short, 1984).

Logan (1991) also criticises medical journalists for their reliance upon "pre-packaged sources" claiming that it results in "disjointed stories." This criticism is echoed in Martin's (2001) concerns regarding the influence of the pharmaceutical industry upon medical research, which she asserts results in "low technology methods that have the potential to alleviate serious disease do not get financial support to support their diffusion, as such means [do not] promise profits."

Quarantelli and Wenger (1991) considering media reporting of disasters, described this reliance upon established sources of information as producing a "command post view" which ignores the perspectives of other groups involved in an incident. Thus in the suspected TB incident media coverage generally relied upon information emanating from the health professionals managing the incident (Addy 1998, Bennett 1998) or a small number of parents willing to be interviewed (Welford 1997, Addy 1998, Allison 1998), and failed to include the perspectives of individuals living or working in the area who did not have children involved in the incident.

Kasperson (1992) however found that "heavy and sustained media coverage of an event does not in itself ensure that substantial public concerns will emerge." Diffusion research would suggest that interpersonal sources also play a part in risk communication.

2.3.4 Opinion leaders

"Risk messages emanate from different sources through formal and informal channels" (Krimsky & Plough, 1988). Although both diffusion theory and social learning theory suggest that interpersonal sources play an important part in the communication of risk assessments, very little research has been conducted in this area of risk communication. Kasperson et al, (1988) for example contend that "information about risks and risk events flows through two major communication networks – the news media and more informal personal networks [but] relatively little is known about informal communication networks." The traditional view of risk

communication as a "linear, top-down, elitist, expert-to-public approach" might account for this apparent lack of study.

Kasperson et al. (1988) are also of the opinion that " it is undoubtedly the case that people do not consider risk issues in isolation from other social issues or from the views of their peers." This assertion forms part of the social amplification of risk framework proposed by Kasperson et al in response to the question, "why do some relatively minor risks or risk events, as assessed by technical experts, often elicit strong public concerns and result in substantial impacts upon society and economy" (Kasperson et al, 1988). The social amplification framework suggests "events pertaining to hazards interact with psychological, social, institutional and cultural processes in ways that can heighten or attenuate perceptions of risk and shape risk behaviour" (Kasperson, 1992). This framework also explains Kasperson's findings (1992) that "heavy and sustained media coverage of an event does not in itself ensure that substantial public concerns will emerge." Although Short (1984) had previously asserted that "the dramatic event which receives extensive media coverage is likely to seem more 'risky' to consumers."

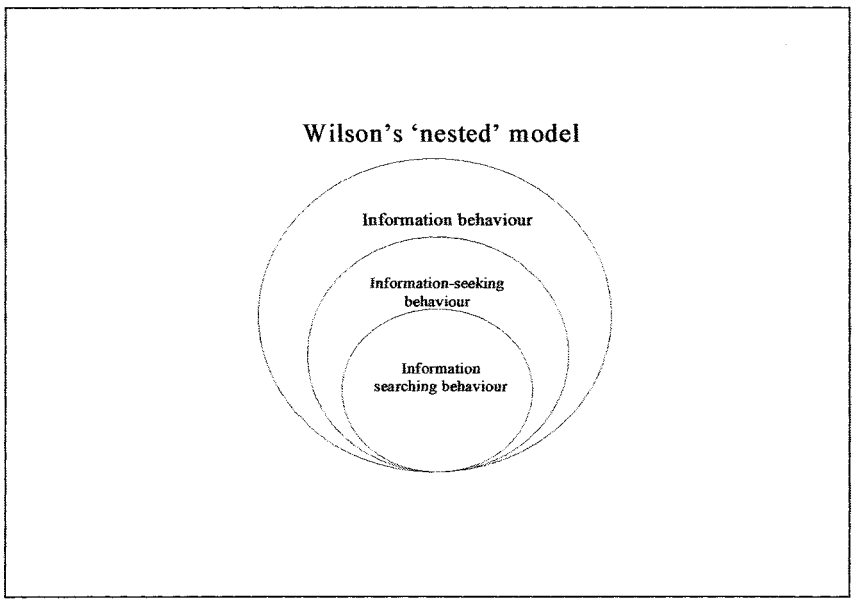
Interaction with social processes highlights the role of individuals in transmitting information through social networks. As well as transmitting information, the social amplification framework also suggests that by modelling behaviour individuals, or groups, act as 'amplification stations'. This suggestion of modelled behaviour clearly links social amplification with social learning, however, the social amplification framework also suggests that "individuals do not act merely in their roles as private persons, but rather according to the role specification associated with their positions" (Kasperson, 1992). An assertion that echoes Douglas and Wildavsky's (1982) cultural perspective of risk interpretation. Kasperson's statement suggests that during the suspected TB incident, individuals employed as health professionals might be expected to attenuate the risks associated with the possible spread of TB when transmitting information within their social network, whilst individuals employed in the local media might amplify the risks associated with TB when transmitting information in their social network. Thus with the concept of homophilous communication, being more effective than heterophilous (See section 2.2.4) it might make a difference whether an individual looked to a health official or a media employee as an opinion leader during the incident as to which risk message the individual received.

The social amplification framework has been criticised for its assumption of individuals as being pro-active rather than reactive in the process of risk communication (Renn, 1992). This view of the individual as an information seeker contrasts with the traditional expert-to-public model of risk communication. Individual's information seeking behaviour is one of the aspects of the research considered in the next research area, information behaviour.

2.4 **Information behaviour**

2.4.1 Background

The field of information behaviour research encompasses a wide variety of research emphases within its broad remit. Indeed, a variety of terms have been applied to research in this field; information practices, information seeking and information behaviour (McKenzie, 2002). Wilson's (2000) nested model of information behaviour research incorporates both information searching behaviour research and information seeking behaviour research (See Figure 2). Information seeking implies an active search for information, whilst information searching, a narrower definition, involves interaction with computer-based information retrieval (Wilson, 2000).



(Figure 2 taken from Wilson, T. D et al. 2000)

Thus studies considering the processes of information retrieval and information searching (Burke, 1997), the activities relating to information seeking (Ellis,Cox and Hall, 1993) and the interaction between information systems and system users (Ching Yang, 1997) are within the remit of information behaviour research. Wilson (1999a) defines information behaviour as "those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information." In relation to the suspected TB incident, therefore, individuals who attended public meetings, contacted telephone help-lines or discussed the incident with friends or relatives were engaging in facets of information behaviour.

Within the various activities described in Wilson's (1999a) definition a number of different research foci have developed. In information seeking research, for example, "one perspective views it as a component of information use, decision making or problem solving [whilst] other researchers have focused upon the processes or components of information seeking" (Cheng & Shaw, 1999).

Information seeking research was traditionally underpinned by an information retrieval model in which "a user recognized an information need and came to the retrieval system with a request based on that need" (Ellis, Cox and Hall, 1993). A number of researchers in the field have rejected this model because they consider it too narrow a construct to adequately reflect the complexity of information seeking behaviour (Kulthau 1991, Dervin 1992, Reneker 1993, Ellis, Cox and Hall 1993, Erdelez 1999). A particular aspect of information seeking behaviour that is not accommodated in the information retrieval model, and is especially relevant for this research, is the notion of uncertainty. This notion, as interpreted by information behaviour researchers, suggests that individuals do not always recognise their information need in precise enough terms to be able to construct a request based on the need. Kulthau (1991) for instance developed her model of information search behaviour upon the premise that "uncertainty, a natural and necessary aspect of the early stages of the information search process, causes discomfort and anxiety which in turn affects articulation of a problem and judgements of relevancy." Wilson (1999a) moreover contends that "we may assume much (perhaps most?) information seeking and retrieval are occasioned by *uncertainty*."

2.4.2 Uncertainty

2.4.2.1 An information system perspective

A number of researchers in the field of information behaviour have considered the aspect of uncertainty. Studies in this area have been conducted from a variety of perspectives and have, therefore, made various contributions to the field. One of the earliest studies in this area was Belkin, Oddy and Brooks' (1982a) "representations of the anomalous states of knowledge (ASKs) underlying information needs." The premise of Belkin, Oddy and Brooks' study was that " an information need arises from a recognized anomaly in the user's state of knowledge concerning some topic or situation and that, in general, the user is unable to specify precisely what is needed to resolve that anomaly." The study was conducted from the perspective of information retrieval system design and the problems associated with its inability to "represent what someone does not know" (Belkin, Oddy & Brooks, 1982a). Belkin, Oddy and Brooks' research addressed the cognitive aspects of information seeking in "describing the constructive process of information seeking in terms of the system user's ASK's" (Kulthau, 1991). The focus of Belkin, Oddy and Brooks' research was upon producing a representation of the searcher's ASK that would enable the information retrieval system to provide information to resolve the anomaly. The study used a problem statement and a structural analysis of the statement as the basis for "the development of primary retrieval strategies based on the classification and structural features of representation" (Belkin, Oddy & Brooks, 1982b). Whilst innovative in recognising the concept of uncertainty as more than "an absence of information" (Daft & Lengel, 1986) Belkin's approach was developed with resolution in terms of the information system design as the goal.

From the same perspective of information system design, Ellis (1989) identified different aspects of information seeking behaviour in his study of the information seeking patterns of various groups of academics. The research focused upon the "behavioural aspects of the retrieval interaction" (Ellis, 1989). Six specific information seeking behaviours were identified in the study:

1. Starting
2. Chaining — following footnotes and citations
3. Browsing — semi-directed searching in an area of potential interest
4. Differentiating — using known differences in information sources as a way of filtering the amount of information obtained
5. Monitoring — maintaining awareness through the monitoring of particular sources
6. Extracting — going through a particular source selectively identifying relevant material from that source

A subsequent study (Ellis, Cox & Hall, 1993) identified two further information seeking behaviours:

7 Verifying — checking that the information is correct
8 Ending

Although displayed as a set of stages above, the behavioural model thus drawn by these studies did not "constitute a hierarchic sequence for classifying individual information seeking patterns ... but rather a set of related categories which, taken together can be used to describe individual information seeking patterns" (Ellis, 1989).

2.4.2.2 An information searching perspective

The notion of resolving uncertainty also underpins Kulthau's research conducted from the perspective of the information searcher, although with information system design as the underlying concern. She states that uncertainty "due to a lack of understanding, a gap in meaning, or a limited construct initiates the process of information seeking" (Kulthau 1993). In contrast with both Belkin, Oddy and Brooks' and Ellis' research, Kulthau's (1991) studies of information seeking incorporate "three realms of human experience; the affective (feelings), the cognitive (thoughts) and the physical (actions)." Kulthau's research employed numerous methods to capture all of these aspects of the participants' information searching behaviour; participant journals recording feelings, thoughts and actions, search logs, written reports at the beginning

and end of the process, questionnaire survey, series of interviews and time-line and flow charts representing the user's experiences. Building upon Belkin, Oddy and Brooks' research, however, and his presentation of information seeking as a constructive process, Kulthau (1993) identified six stages in the information search process of users: -

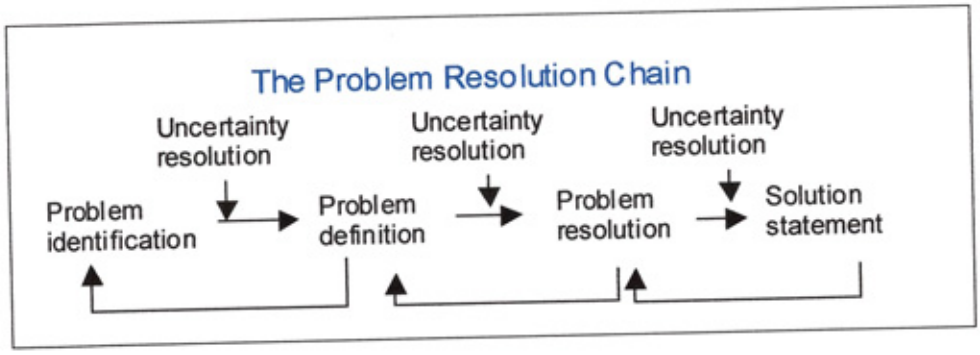
1. Initiation
2. Selection
3. Exploration
4. Formulation
5. Collection
6. Presentation

Kulthau's stages are inter-related and "although the sequence of tasks may appear somewhat recursive, rather than strictly linear, the process proceeds from the initiation to the completion of the project" (Kulthau, 1999).
In the initiation phase the user "becomes aware of a lack of knowledge or understanding" (Kulthau 1993). At this stage in the search process uncertainty is high and the user is likely to "discuss possible topics and approaches" (Kulthau 1991). Determining the approach to be taken, or the general topic, occurs in the selection phase. At this stage, Kulthau (1991) noted "feelings of uncertainty often gave way to optimism after the selection has been made and there is a readiness to begin the search." The third stage, exploration, is often the "most difficult stage for users and the most misunderstood by intermediaries" (Kulthau 1993). During this phase, the user explores within and around the general topic area, to extend their knowledge of the subject and to refine the focus of their information search. Kulthau (1991) notes, that during this phase "users may find the situation quite discouraging and threatening, and may also be inclined to abandon the search altogether." The fourth stage, formulation, is a pivotal stage in the information search process. It is at this stage that the individual begins to move from feelings of uncertainty towards a feeling of confidence. A clear focus for the inquiry is constructed from the information discovered in the previous stage. The information search process targets information relating specifically to the problem awaiting resolution, in the remaining stages of

collection and presentation. The process is complete when sufficient information is retrieved to answer the query and resolve uncertainty.

Recent research by Kulthau (1999) has moreover identified that the stages also related to the complexity of the problem faced and the amount of knowledge the information seeker already possessed. Information searches for simple questions did not display the six stages of the process, whilst more complex questions requiring a degree of learning on the part of the searcher did.

Research by Wilson (1999) has taken this concept of uncertainty, and in particular uncertainty reduction, as the premise for the study of information search behaviour within the more general framework of information behaviour. The project adopted a model of information behaviour that incorporated four stages, with uncertainty resolution occurring between each stage (Wilson et al. 2000). The four stages of the model were:



(Figure 3 taken from Wilson T.D et al , 2000)

These stages are closely related to Kulthau's and, indeed, one of the objectives of the project was to "establish whether the use of Kulthau's model of information searching as a stage process fits the suggested model of multiple searches in a problem solving strategy" (Wilson, 1999). In particular, the project seeks to determine the application of Kulthau's six stages at each phase of uncertainty reduction in Wilson's model. Exploratory results from the study highlighted that "uncertainty is shown to reduce as users identify themselves as involved in successive stages of the problem-solving process" (Wilson et al., 2000).

This research project, however, included an aspect of information behaviour that is not addressed by either Kulthau's or Wilson's model. Neither of these models incorporate a situation, such as the crisis in Ponteland, where no definitive answer exists for the questions posed by the community. Indeed, in some respects the situation experienced by the community was the opposite of the information behaviour modelled above, as the system, the health professionals managing the incident, increased rather than reduced the uncertainty felt by the community members by their inability to provide a definitive answer.
Dervin (1992) suggests a different approach to uncertainty resolution by stating that information seeking behaviour varies with every situation and that the individual's aim is to make sense of the situation.

2.4.2.3 The sense-making approach

Dervin's sense-making approach to uncertainty resolution was developed " to move the perspective of user studies from the prevailing aspect of the observer to the more difficult to determine, but potentially more useful, aspect of the actor" (Dervin, 1992). Sense-making involves both "cognitive activity and behavioural activity" (Rice-Lively, 1997). Sense-making is described by Dervin (1992) as " a set of metatheoretic assumptions and propositions about the nature of information, the nature of human use of information and the nature of human communication." Dervin's background was in communication studies and she, therefore, brings this perspective to her research in information behaviour. Dervin (1992) uses the term information to convey the 'sense' that an individual, or group, creates at a specific moment in time or space. The approach centres on a premise that "as people move through life they encounter gaps in their current knowledge that can only be bridged by making new sense of their situations" (Pettigrew, Durrance & Vakkari, 1999). In this the approach echoes Belkin, Oddy and Brooks' ASK's as an underlying cause of information need.
At the heart of the sense-making approach is an assumption of discontinuity. Discontinuity applies most strongly to the internally controlled behaviour of the information seeker, with the assumption that their information seeking behaviour will vary with each situation encountered (Dervin 1992). As the individual creates 'sense' from the environment around them, which is specific to that time and space, each

situation requires different behaviour. This assumption implies that predictions cannot be made from, for example, demographic attitudes or topic choice as to how information seeking will be conducted. The sense-making approach focuses upon behaviour rather than process, upon how individuals define and bridge discontinuities or gaps.

There are some similarities here with the psychological perspective of risk interpretation outlined previously. (See Section 2.2.1) Both approaches emphasise the role of the individual and *their* interpretation of a risk or gap in their knowledge. As such, both approaches can be criticised regarding the applicability of their research findings from the individual level to a more general level. In fact, both approaches employ similar mechanisms to counteract this criticism.

In sense-making it is argued that, although an individual's behaviour is liable to change there will be consistencies in the external environment within which the information behaviour occurs. In the psychological perspective of risk interpretation, characteristics of risks at a general rather than individual level were identified. It is, therefore, the consistencies and characteristics, rather than the individual behaviour, that allows for generalisations to be made.

In the case of the suspected TB incident, whilst the individual seeking to make sense of the situation would require information according to their specific needs, the external environment i.e. the number of children involved, the testing procedure, the medication programme, etc, was constant for all of the individuals involved in the incident.

Recent research (Spink & Cole, 2001) in the field of everyday life information seeking highlights the importance of the "need for coherence, feelings of uncertainty and the irrational avoidance of information" as factors that affect individual's everyday life information seeking, searching and use. The researchers moreover noted that the achievement of a sense of coherence might not involve any information seeking at all. Spink and Cole (2001) describe the study of everyday life information seeking as "an evolutionary theoretical step away from Dervin's gap-focused starting point in her sense-making theory."

There was undoubtedly uncertainty during the suspected TB incident. However, as this research project is a retrospective study, neither the specific stages of individual searches for information nor the actions individuals took to 'make sense' of their situation could be explored.

All of the research outlined thus far, in relation to uncertainty and information behaviour, is primarily founded upon the premise that the existence of uncertainty is necessarily followed by an active search for information to resolve the uncertainty. Even Spink and Cole (2001), who acknowledged that achieving a sense of coherence might not necessarily involve engaging in information seeking behaviour, described the avoidance of information as "irrational." Research, particularly in the field of health information provision, has however highlighted that avoiding information is anything but irrational.

2.4.3 Information seeking style

Brashers, Goldsmith and Hsieh (2002) state that

> *"whilst information can be used to decrease uncertainty that is distressing, to increase uncertainty that allows for hope or optimism, and to invite reappraisal of uncertainty, information can also increase stress-producing certainty or uncertainty."*

Miller and Mangan, (1983) moreover, state that an individual reacts to information during uncertainty by adopting one of two strategies; individuals either "seek out information or they try to distract themselves from threat-relevant information." Brashers, Goldsmith and Hsieh's (2002) review of research in this area proposed a variety of possible reasons for avoiding information:

- The information itself might be distressing
- The information might conflict with the health beliefs already held by the individual
- The information might determine the meaning of symptoms thereby removing or reducing optimism
- The information might increase anxiety

Thus, individuals who believed that the suspected TB infection was due to contamination of the water supply, might have been unwilling to seek information in case this belief would be contested.

Miller and Mangan (1983) called individuals who avoided information, *information blunters* and individuals who actively sought information, *information monitors.* Their research examined "how the interaction between these coping preferences and the level of preparatory information impacts on stress." The participants in their study, forty patients deemed to be at risk of developing cervical cancer, were identified as *information monitors* or *information blunters* on the basis of their "self-reported preferences for information or distraction in a variety of naturalistic stress situations" (Miller & Mangan, 1983). The research was designed to answer four questions:

1. Does voluminous information increase or decrease a patient's stress levels?
2. Are monitors more or less stressed than blunters?
3. Are monitors who crave information less stressed when they receive it than when information is withheld?
4. Are blunters less stressed when not given information than when unwanted information is imposed upon them?

The study concluded, that "variations in coping style interact with and determine the impact of information" (Miller & Mangan, 1983). The provision of minimal information to blunters resulted in "reduced anxiety, depression, discomfort and psychological arousal", but blunters' stress levels were more aroused when provided with voluminous information. Monitoring, on the other hand, was "associated with greater subjective and behavioural distress before, during and immediately after coloscopy than blunting" (Miller & Mangan, 1983). These conditions were noted for both sets of monitors in the study, those who received minimal information and those who received voluminous information. Two possible reasons for these particular findings were that information monitors provided with minimal information were distressed by the lack of information, whilst information monitors who received voluminous information were "alert for and sensitised to the negative aspects of the event" (Miller & Mangan, 1983).

This research demonstrated that providing considerable amounts of information to individuals could be damaging rather than beneficial. Van Zuuren and Wolfs (1991)

employed Miller's self-reported questionnaire (Miller Behavioural Style Scale) in their study, which aimed to discover "whether situations differ in the degree of monitoring and blunting displayed and whether the use of these coping modes varies with the situational characteristics." The study participants were asked to complete the MBSS, which consists of descriptions of "four stress-evoking situations each followed by monitoring and blunting statements about ways of dealing with the situation" (Van Zuuren & Wolfs, 1991). In addition, the respondents in this study were also asked to "rate the four situations on relevant characteristics such as degree of threat, the degree to which it was possible to obtain additional information and the degree of predictability" (Van Zuuren & Wolfs, 1991). Combing the results of these two reports highlighted that the degree of monitoring was "significantly related to perceived threat and unpredictability". Van Zuuren and Wolfs (1991) therefore, contend that "for high monitors, predictability and controllability are their main concerns." The study did not, however, highlight any significant relationships between information blunting and the characteristics of the threatening situation. In their research, Van Zuuren & Wolfs (1991) also asked respondents to write a report about a threatening situation that they had recently experienced, and to participate in a short interview about the report. Analysis of the data from both the reports and the interviews demonstrated that "many of the respondents started with monitoring behaviour, but their appraisal of the original situation changed by this very mode of coping and new options for choosing a coping strategy arose."

In both Miller and Mangan's (1983) and Van Zuuren and Wolfs (1991) studies, the adoption of an information monitoring or information blunting coping style was neither age nor gender specific. Rees and Bath (1999) also found in their study of adult daughters of women with breast cancer that monitoring behaviour was not related to the age or socio-economic class of the respondent. This study did, however, also highlight that "daughters who thought that patients avoided giving them information were significantly more likely to be high monitors than low monitors." This finding reinforces the findings of Miller and Mangan (1983) above where high monitors were distressed when provided with minimal information. Brashers, Goldsmith and Hsieh, (2002) moreover, argue that "whether relational partners information management activities were appreciated or not was contingent on whether they were matched to the patient's own desires for information." Rees and Bath's study (1999) moreover, noted that "when mothers withheld information from their

daughters it was often motivated by a desire to protect the daughters." Different perceptions about an individual's desire for information held by the individual and the potential information provider can result in behaviours that seem unresponsive or intrusive.

With regard to the suspected TB incident these studies suggest that the strategy of providing information via public meetings in addition to the distribution of newsletters, would have been of limited benefit to the community. As risk interpretation research also suggests that the community was likely to have perceived itself to be in a high-risk situation, the degree of information monitoring due to the level of perceived threat and unpredictability of the situation was, therefore, also likely to be high. Information monitors in this situation availing themselves of the full range of information available, would, according to Miller and Mangan's research (1983) be "alert for and sensitised to the negative aspects of the event." In addition, during the suspected TB incident, information monitors seeking predictability and control would, as the element of uncertainty was introduced, experience particularly stressful responses to the situation. Van Zuuren and Wolfs (1991) findings " that in the course of the development of a threatening situation many respondents used monitoring and blunting alternately" moreover suggest that as the circumstances experienced in Ponteland evolved, members of the community may have adapted their information seeking behaviour to reflect the changing situation.

It is apparent from the above that this research project encompasses the three distinct areas of diffusion research, risk communication and information behaviour in the study of the dissemination process during the suspected TB incident. However, whilst the topic of the project dictates the relevance of these research areas, the project's objective, to characterise and evaluate the dissemination process, commends consideration of one further research field.

2.5 Evaluation

2.5.1 Approaches

The stated aim of this project is to characterize and evaluate the dissemination of information during the suspected TB incident. Evaluation research is in itself a distinct field of social science research. Patton (1990) defines evaluation as "examining and judging accomplishments and effectiveness", and evaluation research as "the systematic and empirical examination of effectiveness through careful data collection and thoughtful data analysis." Tones, (2000) moreover defines the purpose of evaluation as an assessment of the extent "to which valued goals have been achieved." One of the objectives set for this project is to determine the criteria, or valued goals, which had been set for the dissemination process by the information providers during the suspected TB incident. Patton, (1990) however, contends that the purpose of evaluation is to "inform action, enhance decision making and apply knowledge to solve human and societal problems." Whilst this project would make no claim to be solving societal problems, the study does seek to inform the actions of information providers, who might find themselves in the future in similar situations to that experienced in Ponteland.
Greene (1998) identified four major approaches to programme evaluation. Each approach was embedded within a specific philosophical framework. Thus:

1. A systems theory approach within a postpositivist framework
2. A management approach within a pragmatic framework
3. A pluralistic approach within an interpretivist framework
4. An emancipatory approach within a radical, normative science framework.

Each approach utilises different data collection methods, provides responses to different evaluation questions and is targeted at different audiences. King and Appleton's (1999) championing of fourth generation evaluation in health research is an example of the fourth approach above. Lincoln and Guba (1985) developed fourth generation evaluation as a research process in which the "claims, concerns and issues of stakeholders serve as the basis for determining what information is needed." The evaluation conducted in this project, however, follows a pluralistic approach that

incorporates the views of diverse stakeholder groups. Greene (1998) defines stakeholders as, "groups and individuals who have vested interests in the program being evaluated." King and Appleton, (1999) identified the roles of stakeholders involved in the evaluation of health services as:

1. The agents, for example, the funders of the service
2. The beneficiaries, both direct and indirect
3. The victims, for example, groups who may lose their funding as a result of the evaluation
4. The invulnerable stakeholders, for example, those individuals who remain unaffected by the evaluation
5. The temporarily immune, groups that will not be affected by the evaluation until some time in the future

Conducting evaluation research that incorporates the views of all of these disparate groups is an extremely onerous undertaking. Tones, (2000) contends that the various members of the 'stakeholder community' will have different values and different expectations of success. Accordingly, evaluators must then negotiate whose questions will be addressed and whose interests will be served by their work (Greene, 1998). How success is measured in an evaluation, also depends upon which stakeholder viewpoint is under consideration (JISC, 1996). This research project sought to evaluate the dissemination process by incorporating both the information provider and information recipients' perspectives. The evaluation was, therefore, concentrated upon the roles of agent and beneficiary in the list above, although it is acknowledged that the findings of the research may ultimately have an impact upon groups of individuals in similar situations at some time in the future.

2.5.2 Forms of evaluation

As well as the various stakeholder viewpoints, evaluators also differentiate between two forms of evaluation, formative and summative. Formative evaluation is conducted at the design, development and implementation phases of a project (JISC, 1996). The anticipated result of a formative evaluation is recommendations for improvements to the project, and the standard by which the evaluation is judged is the usefulness of the

findings to the intended users in the project studied (Patton, 1990). Summative evaluation, on the other hand, is conducted at the end of the project. The anticipated result of a summative evaluation is an overall judgement of the effectiveness of the project, and the standard by which the evaluation is judged is the extent to which the aims of the project were achieved. Tones, definition of the purpose of evaluation as an assessment of the extent "to which valued goals have been achieved", therefore, relates to summative evaluation, rather than formative evaluation, whilst Patton's broader definition could be applied equally to formative or summative evaluation. Patton (1990), moreover, contends that summative evaluation should be judged by the generalizability of the evaluation findings to similar projects or programmes. Of necessity, this research project was conducted at the end of the information dissemination process, therefore, the evaluation was judged upon the extent to which the criteria set for the dissemination process were met from both the perspectives of the information provider and recipient.

In addition to the two forms of evaluation, there are different levels of evaluation (Banwell, 2000). Evaluation may be conducted at any of the following three levels:

1. Performance evaluation
2. Impact level evaluation
3. Synthesis level evaluation

Performance evaluation, the lowest level, is intended to provide data, as its name suggests, on the performance of the initiative. The results of this level of evaluation are fed back into the project to improve performance. Performance evaluation is, therefore, most frequently an element of formative evaluation. Impact level evaluation, however, extends the evaluation to the consideration of "what is happening as a result of the project's activities" (Banwell, 2000). Synthesis level evaluation, the highest level, seeks to evaluate "what has been learned from the whole project" (Banwell, 2000). The evaluation in this research is aimed at the synthesis level. The discussion of the research findings will include reflections upon the evaluation, the research methodology and the contribution made by the research to debates within the various research areas. In addition the implications of the research findings for research, practice and education in information studies will also be highlighted.

2.5.3 Evaluation design

The Tavistock model of evaluation, (JISC, 1996) identifies six elements of evaluation design:

1. Purpose of the evaluation
2. Stakeholders
3. Lifecycle
4. Utilisation
5. User involvement
6. Methods and techniques

As noted above the purpose of an evaluation can range from assessing whether specific goals have been achieved, (Tones, 2000) to solving problems (Patton, 1990). The evaluation of the information dissemination process during the suspected TB incident is intended to assess whether specific criteria were met, by incorporating the views of both information providers and information recipients. Utilisation concerns "capturing the learning from the project in all its forms, and making it available for other and future projects" (JISC, 1996). Utilisation requires consideration of the context within which the project is conducted, and the relation of the evaluation findings to current developments in the field. Submission of articles to peer-reviewed journals and presentations at conferences are two recognised means of making evaluation findings available for others. During the research for this thesis presentations were made at conferences in health information management, (Duggan & Banwell, 2000), qualitative evidence-based practice (Duggan & Banwell, 1999) and evidence-based librarianship (Duggan & Banwell, 2001) and a paper was published in a collection of international papers relating to the human aspects of the information society (Duggan & Banwell, 2002). All of these publications were joint-authored with Dr Linda Banwell, the research supervisor. It is anticipated that further conference presentations and/or journal articles will be submitted where considered appropriate upon completion of this research project.

In the Tavistock model, user involvement is recommended as part of the research design, as the involvement "increases the likelihood that the final products and

services will meet the needs of users and achieve project goals" (JISC, 1996). Users are a valuable source of input and feedback for any project. The task for any evaluator, however, is to provide a framework for the accurate and thorough representation of user's views (Patton, 1990). The qualitative research paradigm with its emphasis upon incorporating the users' own words is an appropriate approach, to ensure that accurate and thorough representation is achieved.

Methods choices in evaluation studies must match the information needs of the identified evaluation audiences (Greene, 1998). As Patton, (1990) points out, however, there are no rigid rules for making data collection and methods decisions in evaluation. The data collection methods employed in this project included interviews with key informants to ascertain the criteria set for the dissemination process by information providers during the suspected TB incident, questionnaire surveys of both adults and children in the community, and telephone and face-to-face interviews with individuals living and/or working in the community. These methods were selected to ensure that the evaluation of the information dissemination process during the suspected TB incident encompassed the perspectives of both the information providers and the information recipients, both adult and child.

2.6 Conclusion

This project is novel in encompassing the research areas of risk communication, diffusion and information behaviour in one study. To adequately characterise and evaluate the information dissemination process during the suspected TB incident, however, all of these areas require consideration. Although the research areas are diverse, they are linked by the common thread of information provision and use. Whilst consideration of information diffusion is rare, the concepts of information distribution and use are relevant in diffusion research. Risk communication research, moreover, is primarily concerned with the distribution of a specific type of information. Basing this study in the multi-disciplinary field of information studies enables acknowledgement of the diversity within the three areas, whilst retaining the common thread at the heart of the research.

In addition, this multi-disciplinarity enables the research methodology employed in the study to reflect the diverse traditions, which the study encompasses. The study is neither tied to the predominantly quantitative traditions of risk assessment nor the

prescriptive research patterns of diffusion research. The methodological approach taken in this study and the methods employed in this project are the subject of the following chapter.

3.1 Introduction

This chapter describes the methodological approach taken in this study, outlines the specific research methods employed and the measures taken to ensure the credibility of the research process. The broad aim of this research project and the objectives of the study have only been briefly outlined in the previous chapters. This chapter, therefore, also sets out the broad aim of this study and the specific objectives set for the research. Achievement of the objectives, will, it is anticipated facilitate fulfilment of the research aim.

In many instances the methodology adopted in a research project is predetermined by "disciplinary prescriptions, concerns about scientific status, old methodological habits and comfort with what the researcher knows best" (Patton, 1990). One of the fundamental elements of qualitative research is the interpretive nature of the research process. Research aims and objectives are subject to modification and alteration as a result of data analysis and interpretation. The aims and objectives specified here are exploratory rather than prescriptive and, therefore, represent a direction for the study rather than a prescribed route.

3.2 Research aim

Francis (1997) states "developing a research design means turning the uncertainty identified as the main target into a manageable problem or set of problems to be solved." Blaxter, Hughes and Tight (1996) also contends that once a research topic has been chosen it will almost certainly need to be refined and focused. In this project, the uncertainty identified as the main target was an opinion that the suspected TB incident presented an ideal opportunity to consider the process of informing a community during a crisis. Refinement of this topic, however, suggested that the focus of the research was not upon how many newsletters were distributed or how many meetings were held, but instead upon how effective the methods used were in informing the community.

Defining the research question suggests methods and theories that may be most appropriate for a project (Blaxter, Hughes and Tight, 1996). Thus, focusing the

research upon the effectiveness of the information process, in this instance, immediately places the project in the field of evaluation research, (See section 2.5) which has generally accepted research norms that could potentially guide the conduct of this project. The nature of the crisis, a suspected outbreak of TB infection, also suggested the area of risk communication as an alternative source of appropriate research methods for the study. The most appropriate methods and, indeed theories, however depend upon the research question set and the intended audience for the research findings.

In this study two aspects of the information dissemination process during the suspected TB incident will be examined. In addition to the consideration of the effectiveness of the information dissemination effort, the study seeks to identify what evidence exists of the effectiveness of information dissemination strategies.

The broad aim of this research project is thus to:

Characterise and evaluate the dissemination of information to a community during a crisis

Characterising the dissemination of information during the suspected TB incident involves constructing a definition of effective information dissemination. The definition will then be applied to the specific circumstances of the information dissemination effort in Ponteland. Constructing a definition involves identification and determination of both the nature and the findings of existing research considering the effectiveness of information dissemination strategies. The evaluation will then consider the information dissemination process during the suspected TB incident using the characterisation of effective information dissemination as a framework for the study.

3.3 Research objectives

Once the research question is refined and focused, and a broad aim for the project is produced, a number of decisions must then be made by the researcher. As Sridhar (1995) points out the design of research is a decision making process. Janesick (1998) suggests researchers should consider the following issues at the beginning of a study:

1. The questions that guide the study
2. Selection of a site and participants
3. Access and entry to the site and agreement with the participants
4. Timeline for the study
5. Selection of appropriate research strategies

Cohen and Mannion (1980) propose the formulation of a set of research objectives within the general framework of the research aim to reduce the scope of the project to manageable proportions. This project aims to explore variations and differences in experiences and outcomes from the phenomenon of the suspected TB incident. In these situations, the employment of a naturalistic inquiry strategy results in the adoption of an emerging research design. Initial research objectives may require modification when the initial focus of the inquiry is found to be inadequate or inappropriate (Lincoln & Guba, 1985).

In this project, three objectives were initially set for the research. The intention in setting the objectives was to render the project more manageable and, therefore, the objectives did not reflect all aspects of the research to be undertaken. Furthermore, it was accepted that additional objectives might be set as the research progressed. The initial objectives were thus:

1. To determine the existing evidence of the effectiveness of information dissemination strategies
2. To determine the criteria set for the dissemination of information during the crisis in Ponteland

In addition, this research is conducted under the regulations pertaining to the award of doctoral degrees. There is, therefore, an expectation that this research, when published, will make an original contribution to the research literature in information studies. Accordingly, a third objective was set at the outset for the research:

3. To identify and develop research methods that reflect the cross-disciplinary nature of the topic

Determining the existing evidence of the effectiveness of information dissemination strategies will establish a framework for consideration of the process in Ponteland. Patton (1990) describing evaluation research, states that evaluations using qualitative research methods strive to understand a phenomenon or programme as a whole. Thus, in order to understand and evaluate the dissemination of information during the suspected TB incident, it is necessary to first understand the nature and organisation of information dissemination. The criteria set for dissemination in the suspected TB incident can then be placed in the context of existing evidence of the effectiveness of information dissemination strategies.

By definition, moreover, the purpose of evaluation is to assess the extent to which valued goals have been achieved (Tones, 2000). In any given situation, the goals will be as many and as varied as the participants in the process. The criteria for the information dissemination process in the suspected TB incident, therefore, need to be explicitly stated by all of the participants in the process.

The initial questions are thus set to guide the study but the research design however, remains flexible to allow for alteration or modification if necessary.

3.4 Methodological approach

3.4.1 Disciplinary prescriptions

Traditionally the health field employed quantitative approaches to research (Beck, 1993). Studies investigating outbreaks of infectious diseases, similar to the early stages of the suspected TB incident, would seek to quantify risk factors and highlight statistically significant variables, thereby enabling identification of probable sources of infection (Llewellyn, Palmer & Evans, 1998). Historically, the positivist perspective dominated research designs in the health field, with the emphasis upon "measured variables and provable propositions" (Maykut & Morehouse, 1994). In the field of information studies however, the picture has been less clear. Some authors state that the field of information studies traditionally employed predominantly quantitative methodologies, (Glazier & Powell 1992, Gorman & Clayton 1997) whilst

others contend that researchers in the field have primarily employed qualitative methods of inquiry (Shera 1972, Feehan et al., 1987). This diversity of viewpoint, to some extent, reflects the multi-disciplinary nature of information, the central element of information studies and information science research.

Researchers in the field of information studies should reflect this multi-disciplinarity in their approaches to research. Dissertations and published research papers in the information research field encompass, therefore, a diversity of methodological approaches. Powell's (1999) review of library and information science research included several analyses of the research methods employed in both doctoral research and other published research. The analyses covered a twenty-year period, and listed as many as twelve separate categories of research methods, which included both quantitative and qualitative research methods. The categories themselves ranged from quantitative, experimental research to qualitative, descriptive bibliographical research. The launch of a national library research program in 1996 in Florida State University is an exemplar of this diversity. One of the stated aims of the research program was "to explore interdisciplinary perspectives and new methodological approaches" (Powell, 1999). The 83 papers submitted to the conference displayed a "number and diversity of research methods as well as topics" (Powell, 1999). Gorman and Clayton (1997), however, counter this flattering view of LIS research with their contention that "information science has caught the research disease and there are thousands of postgraduate dissertations and theses, and countless papers on almost every topic imaginable."

In cross-disciplinary research projects, such as this study, it is particularly important that the research design reflects the philosophies of all of the relevant disciplines. The audience for the research, drawn from the different disciplines, naturally bring their own research traditions to their reading of the research report. Anchoring the study to philosophies that are recognisable to the various audiences will, therefore, facilitate their readings of the report.

Despite Gilchrist's (1992) exhortation "to reject the tyranny of methodology", researchers bring to each study their particular understanding of the research process. Maykut and Morehouse (1994) describe this understanding as "the bedrock on which to conduct research." Wass and Wells (1994) moreover state that the "research methodology bridges the gap between higher philosophical ideas and the actual

research findings." The type of research question posed, therefore, is an example of a researcher's methodological stance. A researcher's beliefs and assumptions about the nature of reality, for example, will steer their research in a particular direction. Creswell, (1998) noted how differently researchers with backgrounds in distinct traditions of qualitative inquiry, approached the study of the same incident. Although the circumstances studied did not change, each research project was designed differently. An epidemiologist studying the suspected TB incident would seek to establish the source and route of the suspected infection, a biographer would perhaps study the incident as a significant moment in the life of one or more of the individuals involved, whilst a phenomenologist would "attempt to describe the meaning of the lived experience" (Creswell, 1998) for several of the individuals involved in the incident. None of these approaches are taken in this project, however, as neither the study nor the researcher is tied to these particular inquiry traditions, instead the study design includes elements from various research traditions.

The multi-disciplinary nature of information studies research is encapsulated in Powell's (1999) question:

Does library and information science have a generally accepted research norm?

Powell does not provide the reader with a definitive answer to the question, but does discuss thirteen different research methods that are already in use in the field, and as many again that could potentially be used. Patton's (1990) assertion, therefore, at the beginning of this chapter, certainly in relation to disciplinary prescriptions would not appear to hold true for the field of information studies research.
With regard to 'concerns about scientific status' within the field Cooper (1992) noted that "the debate about the value and contributions of qualitative versus quantitative research in library and information science has continued over several decades." Perhaps, however, due to the multi-disciplinary nature of the field, the debate has not been as hotly contested in this field, as has been the case in other research areas. Siedman (1998), for example, describes researchers in education in the 1970's as being in two "almost warring camps: quantitative and qualitative." Despite a growing acceptance of qualitative research in the field of education research, Siedman

contended "doctoral candidates choosing to do qualitative rather than quantitative research may have to fight a stiffer battle to establish themselves as credible." Whilst disciplinary prescriptions and concerns about scientific status apply to areas of research in their entirety, methodological habits and comfort with what the researcher knows best are considered at the level of the individual researcher. In this particular research project, the researcher does not have the long acquaintance with particular forms of inquiry that is required to constitute a habit or, indeed, comfort with a particular methodology. Moreover, one of the stated objectives of the research is to identify and develop research methods, which reflect the cross-disciplinary nature of the topic, and therefore the accusations of habit or comfort cannot be upheld.

3.4.2 A 'quiet revolution'

In the health field, particularly, the incorporation of a user-centred approach to research has been part of a more widespread "quiet methodological revolution" (Denzin & Lincoln, 1998). The revolution is founded upon "an interpretive, qualitative approach to research" (Denzin & Lincoln, 1998). Historically, in many areas of research, qualitative research methods were only considered appropriate for exploratory research, which would then be followed by rigorous investigation using quantitative research methods (Bryman, 1988). Wildemuth (1993) however, argues that "interpretive approaches can be appropriate for any stage of a research programme." One aspect of the 'methodological revolution', therefore, has been the growing acceptance of qualitative research projects as being an "end in themselves" (Bryman, 1988). In addition, the methodological revolution has been exemplified by a "move away from the traditional macro-approach, studying large groups via questionnaires or structured interviews, to a micro-approach, involving more intensive study of small groups via observation and unstructured interview techniques" (Ellis, Cox & Hall, 1993). Sug Yoon and Byles (2002), for example, conducted focus group discussions with 35 participants to "gain insight into people's thoughts on stroke, and to inform the development of educational strategies in the community." Whilst Given (2002) employed in-depth qualitative interviews with 25 mature students to examine their "everyday-life information seeking in the context of their academic work."

A result of this 'methodological revolution' is that both quantitative and qualitative research methods are now regularly employed in the information studies and health research domains (Gorman & Clayton 1997, Beck 1993). Investigators in the health field employ a range of qualitative methods to elicit the users perspective of the services provided. Rees and Bath (1999) used focus group discussions to "explore and develop an understanding of the information needs of breast cancer patients and their spouses." Wood et al. (1995) employed a variety of qualitative research methods, including in-depth interviews and concept mapping, in their case studies of thirteen general medical practices. Health researchers, moreover, increasingly consider medical interventions within their broad social context rather than as a single clinical event, although it should be noted that some resistance to qualitative research still exists in the health field (Taylor 2000, Daly, McDonald & Willis 1992, Beck 1993).

In the field of information studies, the strong service provision ethic in the practice often lends itself to interpretive, holistic research (Gorman & Clayton, 1997). Information providers acknowledge that the better the understanding they have of the information recipients behaviour in relation to searching for, and finding information, the better the service they can provide (Palmquist & Kim, 1998). Ellis, Cox & Hall (1993) employed in-depth interviews to identify the information seeking patterns of groups of research physicists and research chemists. Reneker (1993) asked University students and staff to record "their information seeking activities over a two-week period." Transcripts of the recordings were returned to the informants with additional questions, then follow up interviews were conducted. Information studies research, however, is not restricted to the qualitative research paradigm. Lee et al. (1999), for example, adopted an experimental research design to study the "impact of choice accountability and issue involvement on the information search and use" of fifty-eight undergraduate students. Marcella and Baxter, (1999) conducted a questionnaire based survey of a national sample of the UK population "designed to elicit preliminary data on the use of and need for citizenship information."

Patton (1990) asserts that qualitative and quantitative methods are "alternative, not mutually exclusive" research strategies, and both can be collected in the same study. Wildemuth (1993) also states that the method applied in a particular study, should be selected based upon the research question being addressed. Bryman, (1995) considers

that combining qualitative and quantitative research methods enables researchers to check the validity of their findings. Gilchrist (1992) meanwhile encourages researchers to "reject the tyranny of methodology and use whatever method best answers the question at hand." Porcellato et al (1999) moreover, concluded that the 'rich' information gathered from the qualitative methods "not only substantiated the factual 'outcome' data of the questionnaires but enriched them as well." Saint-Germain, Bassford & Montano, (1993) compared the results of a randomly selected population survey against data collected from focus group interviews with 50 informants. They found that the data collected in the focus group interviews was "more suited to reproducing community attitudes and patterns of practice", whilst the responses to the questionnaire survey "documented individual levels of knowledge and practice" (Saint-Germain, Bassford & Montano, 1993).

Determining the questions that the research aims to answer decides to some extent the type of data required to answer those questions. There are, however, no hard and fast rules that can be applied to research design. In this research project, although a qualitative methodology underpins the study, particular elements of the research are amenable to quantitative methods and these have been employed where considered appropriate.

3.4.3 Qualitative research

Before designing a research project employing a qualitative research methodology it is important that the researcher is clear about what is meant by *qualitative* research. The art and practice of qualitative research is not restricted by disciplinary boundaries, and the definition adopted, in many cases, is determined by the background of the researcher.

Denzin and Lincoln, (1998) for example, writing for social scientists in their *Handbook of Qualitative Research* paraphrased an earlier definition of cultural studies to define qualitative research.

> *"Qualitative research is an interdisciplinary, transdisciplinary and sometimes counterdisciplinary field. It crosscuts the humanities and the social and physical sciences. Qualitative research is many things at the same time. It is multipragmatic in focus. Its practitioners are sensitive to the value of the multimethod approach. They are committed to the naturalistic perspective, and to the interpretive*

understanding of human experience. At the same time, the field is inherently political and shaped by multiple ethical and political positions.
Qualitative research embraces two tensions at the same time. On the one hand, it is drawn to a broad, interpretive, postmodern, feminist, and critical sensibility. On the other hand, it is drawn to more narrowly defined positivist, postpositivist, humanistic and naturalistic conceptions of human experience and its analysis."

Glazier and Powell (1992) and Maykut and Morehouse (1994), moreover, defined the term by highlighting the differences between quantitative and qualitative approaches to research. It is, however, incumbent upon researchers to be explicit in their reports about their own particular beliefs and biases. The definition of qualitative research adopted in this study, is that proposed by Gorman and Clayton for information professionals (1997).

"Qualitative research is a process of enquiry, that draws data from the context in which events occur, in an attempt to describe these occurrences , as a means of determining the process in which events are embedded and the perspectives of those participating in the events using induction to derive possible explanations based upon observable phenomena".

Furthermore, the research strategies employed in the project, are underpinned by Fidel's (1993) attributes of qualitative research. Qualitative research is:

1. Non – manipulative and non-controlling
2. Both holistic and case oriented
3. Humanistic
4. Open and flexible
5. Inductive.

These attributes of qualitative research inform the design and implementation of this study. The open and flexible nature of the qualitative approach encourages, for example, the adoption of an emergent research design, whereby sampling strategies may change in response to the results of the concurrent data analysis.
Thus in this particular project, the precise number of interviews that will be conducted are not specified at the outset of the study. The non-manipulative and non-controlling aspects of qualitative research, also has particular implications for phases of the fieldwork, such as the conduct and analysis of interviews. Issues, such as the use of tape recorders in interviews or the extent to which the interviewer exchanges information with the respondent, are of concern to qualitative researchers as both may

have an influence upon the informants' behaviour or responses. The non-controlling nature of qualitative research is also an important attribute in this study where child participants are involved in the fieldwork and the potential for an unequal relationship between researcher and respondent needs to be particularly guarded against.
Whilst these issues are relevant throughout the entire cycle of a research project they require particularly careful consideration in the initial stages of the research design.

3.5. Research Design

3.5.1 A 'blueprint' for the research

Patton (1990) asserts that designing an evaluation is "as much art as science" and that "any given design is necessarily an interplay of resources, possibilities, creativity and personal judgements by the people involved." The methodological approach taken in this study is broadly qualitative with some elements of quantitative research where appropriate. Within this broad methodology a wide range of data collection methods might be employed. Qualitative research designs, best characterized as unique and flexible (Zyzanski et al., 1992), can capture a wealth of information about the phenomenon being studied, and incorporate a range of views and perspectives. The uniqueness of each situation studied, however, renders generalisation of the results to a wider population difficult, whilst the specific interpretation of each study's findings can be difficult to substantiate. Quantitative research designs, with their emphasis upon experimental or survey research, on the other hand are characterized as replicable and structured. Quantitative research is frequently preferred when a large response is required in a short time scale, or from "widely dispersed locations" (Bennion, 1982). These designs have, however, been criticised for not reflecting participant responses in real-life situations and removing responses from the context of the inquiry (Yin 1994, Guba & Lincoln 1998).
Combining both types of research designs in a particular study enables the weaknesses identified with one type to be compensated for by the strengths of the other. Thus, qualitative interviews involving a relatively small number of participants are complimented by the employment of a questionnaire survey of community

members. The richness of the interview data is thereby supported by the diversity of opinions gathered in the questionnaire survey.

Yin (1994) calls the research design the "blueprint" for the project and suggests that it should consider:

1. What questions to study
2. What data are relevant
3. What data to collect
4. How to analyze the results

Whilst Janesick (1998) suggests researchers should consider the following issues at the beginning of a study:

1. The questions that guide the study
2. Selection of a site and participants
3. Access and entry to the site and agreement with the participants
4. Timeline for the study
5. Selection of appropriate research strategies

In this study, the research questions posed at the outset were:

1. What evidence exists of the effectiveness of information dissemination strategies
2. What were the criteria set for the dissemination process in the suspected TB incident, and were they achieved?

These particular questions require the collection of data from existing research literature, in the first instance, and the providers and recipients of information during the suspected TB incident, in the second instance. Adopting a broadly qualitative research methodology for the project suggests potentially relevant research methods at the outset. Qualitative researchers look at the whole picture of an event rather than selecting individual components to study. Qualitative researchers seek to consider all

the aspects of the event to develop a "fuller and richer understanding." (Gorman & Clayton, 1997) In general, this understanding is derived from analysis of the words of the actual participants in the event. Gorman and Clayton's (1997) definition of qualitative research above states that qualitative research "draws data from the context in which events occur." Creswell (1998) notes that in case study research "data collection is extensive, drawing on multiple sources of information, such as observations, interviews, documents and audio-visual materials."

3.5.2 The 'preferred' strategy

In this study of the suspected TB incident, the context within which the dissemination process occurred was an important element of the incident that ought to be retained during analysis. The medical aspect of the crisis, the uncertainty of the diagnosis and the characteristics of the community involved, for example, were all part of the context within which understanding of the incident would be developed. One of the main criticisms of quantitative research, is that analysis of the data 'strips' the context from the inquiry (Zyzanski et al. 1992, Guba & Lincoln, 1998). A qualitative research design, on the other hand, using a case study, emphasizes the context as an essential element of meaning (Greene, 1998). Single case studies "tend to be the dominant mode of qualitative work in the UK" (Dingwall, 1992). Although, as Bryman (1995) points out "not all case studies can adequately be described as instances of qualitative research, since they sometimes make substantial use of quantitative research methods." Stake (1998) contends that deciding to conduct a case study is "not a methodological choice but a choice of objects to be studied." Yin (1994) however thinks this definition is "too broad" and asserts that case studies are the "preferred strategy when 'how' or 'why' questions are being posed."

Creswell (1998) defines a case study as an "exploration of a 'bounded system' or a case over time, through detailed in-depth data collection involving multiple sources of information rich in context." In this particular study, the research sought to determine *how* information was disseminated during the suspected TB incident, and *why* the information was disseminated in such a manner. The research also sought to study the dissemination process through data collected from a range of 'information rich'

sources. Data would be found in documents and audio-visual materials produced at the time, and by interviewing and questioning individuals who were involved in the incident. Creswell's (1998) definition of a case study can therefore be applied in this instance.

3.5.3 Case study designs

Yin (1994) identified four different case study designs:

1. Holistic, single case designs
2. Holistic, multiple case designs
3. Embedded, single case designs
4. Embedded, multiple case designs

In embedded case studies a number of different elements, or units of analysis, within a case are considered separately. This study of the suspected TB incident conforms to Yin's definition of an embedded, single case. The research relates to one specific case, the suspected TB incident, but several units of analysis are embedded within the case, for example, the information providers from health, education and other sources, and the information recipients, child or adult. If this project had also studied other incidents, using the same units of analysis, the study would have become an embedded, multiple case. A holistic case design, on the other hand, studies a case, or cases, in its or their entirety. These types of case study design are traditionally associated with medical research, whereby the patient, or group of patients with the same symptoms, is the case or cases. The group of children with positive test results were a holistic, multiple case study for the health professionals treating them. If, however, one of these children had developed signs of an active TB infection, that child would then have become a holistic, single case for the medical team.
Stake (1998) also identified three different types of case study:

1. The intrinsic case study
2. The instrumental case study
3. A collective case study

A case study conducted because of the researcher's interest in the particular set of circumstances that the case exhibits is an intrinsic case study. The case is considered on its own without any suggestion that the findings from the case study can be applied to other cases, or will generate theoretical insights. Instrumental case studies, on the other hand, are undertaken to "provide insight into an issue or refinement of theory" (Stake, 1998). The interest in a case is in its capacity to exhibit a particular theory or concept. Collective case studies, as the name suggests, consider a number of cases to better develop understanding of a particular interest. Stake (1998) does point out that studies "seldom fit neatly into the categories," and indeed, the study of the suspected TB incident could be described as an intrinsic case study, as the research has been undertaken because of the researcher's particular interest in the specific circumstances of the incident.

This research project might also be considered to be an instrumental case study, as the research has also been undertaken to provide an understanding of the process of dissemination. Stake (1998) does state that "there is no line distinguishing intrinsic case studies from instrumental case studies." The first phase of the fieldwork in this particular study corresponds closely with the definition of instrumental case studies, as in this phase of the research the focus is very clearly upon the process of dissemination, with the intent to gain an insight into the issue of the effectiveness of information dissemination strategies. The remaining phases of the fieldwork, however, with their emphasis upon gathering data about the specific dissemination process during the suspected TB incident, correspond more closely with the description of an intrinsic case study.

Case studies often include data collected from in-depth interviews, observation, analysis of documents and questionnaire responses. Indeed Bryman (1995) notes that case studies "exhibit the whole gamut of methods of data collection." Whilst the research methods may differ, the reason for conducting a case study is generally consistent, to explore the particular aspects of the specific case.

3.5.4 The boundaries of the case

When conducting a case study the first step a researcher must take is to define the case to be studied. Patton, (1990) states that any of the following may be a case study:

1. A person
2. An event
3. A program
4. An organization
5. A time period
6. A critical incident
7. A community

In this research a critical incident, the suspected TB incident, was the case to be studied. Morse (1998) contends that selecting the research setting is an important step and must be considered early. Defining the incident as the case determines the geographic boundaries of this case study, as the incident was limited to a specific geographical area. The next step in defining the case under scrutiny then involves specifying the time boundaries of the case, i.e. the precise beginning and end of the case (Yin, 1994). Turner (1994) conducted a case study of behaviour during a fire at a holiday complex. At the outset he had to define the boundaries of the crisis. He considered the crisis to have begun when the "possible threat was first discerned and people involved had to start making choices about how to deal with the situation." The crisis was considered to have ended when "no further threat existed or when no further choices were possible." Using Turner's definition of a crisis the suspected TB incident began upon notification to parents of the first set of unusual test results. Defining the end of the case was not so straightforward. The crisis could be said to have ended when the health officials announced that they did not consider the children to be at risk of TB infection. The children who recorded positive test results, however, still receive annual questionnaires from the health professionals managing the incident, thus indicating that for the health professionals and these particular children the crisis has not yet concluded. For the purposes of this study, however, the end of the crisis and therefore the case was defined as the date by which the majority

of the children with positive test results completed their course of medication. This point was reached some eight months after the start of the suspected outbreak, by which date, newsletters were no longer being distributed, public meetings were no longer scheduled and health officials had stated that it was highly unlikely that children would develop signs of the active disease (TB update 03/06/98).
Once the definition of the geographic and time boundaries are set, the next stage in the research design is to determine the data collection methods. Although the boundaries of the case were acknowledged, within these boundaries a variety of different elements of the case might be studied. In this research project, the focus of the case study was upon the process of information dissemination during the suspected TB incident, and also upon issues surrounding the information dissemination process. The first phase of the data collection, therefore, concentrated upon gathering data about information dissemination methods. In this phase of the project relevant data was evidence of the effectiveness of particular information dissemination methods. The subsequent stages of the fieldwork would then be focused upon collecting data from multiple sources that would illuminate for the researcher the specific process of information dissemination during the suspected TB incident.

3.6 Data Collection Methods

3.6.1 Data collection

The data collection method considered appropriate for the first research question, a qualitative systematic review of research literature, combines aspects of both qualitative and quantitative research. The collection of data from existing research literature in a systematic way suggests a quantitative emphasis, but synthesis of the data contained in the research literature will be undertaken with a qualitative rather than quantitative emphasis. The intent of the review is to determine the nature of the existing evidence of effective dissemination and thus, some interpretation of the studies is required. In addition in this study the notion of effectiveness posited for the review includes an evaluation of the dissemination effort by the recipient of the information. The qualitative systematic review is, moreover, employed for two particular reasons:

1. To contribute to the determination of the process in which the suspected TB incident was embedded (Gorman & Clayton, 1997)
2. To meet the stated objective to identify and develop research methods that reflect the cross-disciplinary nature of the topic

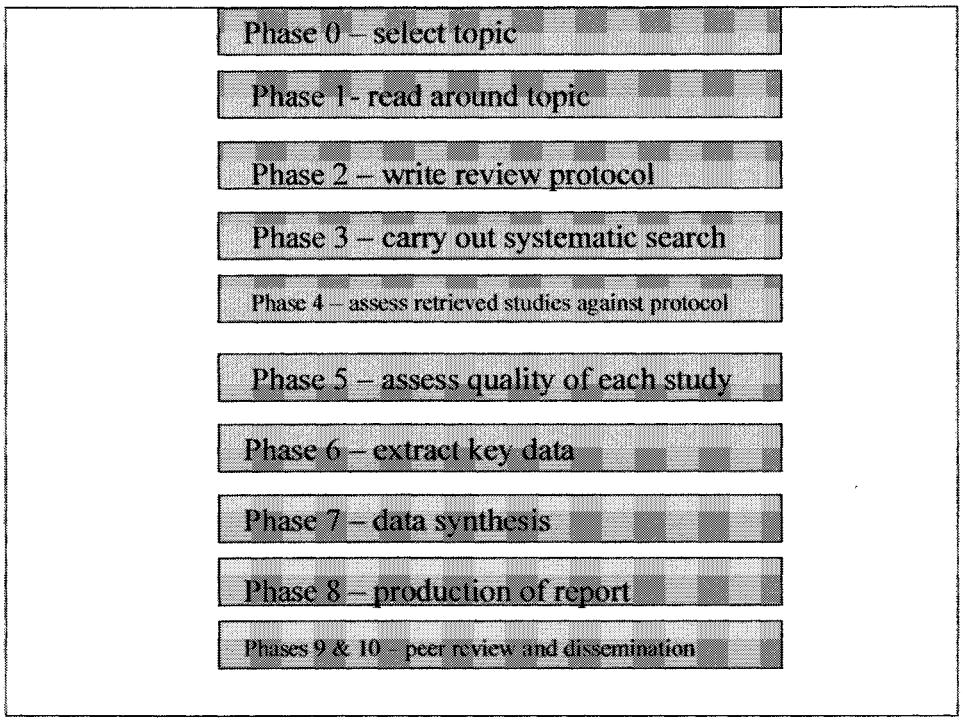
With regard to the second research question, relevant data might be gathered in a variety of ways. Analysis of documents relating to the dissemination process might provide the requisite data. A questionnaire survey of the prominent information providers might also gather relevant data. It was anticipated, however, that there may well be criteria for the dissemination process that would not be explicitly stated in documents, and, moreover, key information providers who were not prominent in the process. An appropriate data collection method to provide an answer to the second research question would therefore be to conduct interviews with key informants to gather data about the process of dissemination, employing a sampling strategy that could accommodate new informants identified during the interviews. These interviews would, however, only provide part of the answer sought as the question of whether the criteria were achieved necessitates some response from the recipients of the information disseminated. The intent in this project was not to elicit purely individual responses regarding the dissemination process, but rather to gather a composite picture from various groups within the community therefore, this phase of the research will include a quantitative element. A questionnaire survey of the members of the community, whilst "documenting individual levels of knowledge and practice" (Saint-Germain, Bassford & Montano, 1993) will also allow for aggregation of the results on socio-demographic, or other groupings.
Combining the different elements of data collection in such a manner, will enable the incorporation of a variety of views in the subsequent synthesis and analysis of the data.

3.6.2 Qualitative systematic review

The method employed for data collection in the first phase of the fieldwork is a systematic review of the research literature regarding the effectiveness of information dissemination methods. "Systematic reviews are a scientific tool, which can be used to summarise, appraise and communicate the results and implications of otherwise unmanageable quantities of research" (NHSCRD, 1996). Unlike traditional literature reviews, which may be "no more than a subjective assessment by an expert using a select group of materials to support their conclusion," systematic reviews are designed to be "systematic in both the identification and evaluation of materials, objective in their interpretation and reproducible in their conclusions" (Booth, 1999). They have, most commonly, been used in the field of medicine to collate research into, and thus demonstrate the effectiveness of, a specific method of treatment e.g. grommets. Health information practitioners have, however, investigated adopting the method to ascertain the effectiveness of aspects of their practice. A feasibility study undertaken by the Health Libraries Group (HLG) reported that it was possible to conduct a *qualitative* systematic review in a health information setting (Booth, 1998). The HLG intent in adopting and adapting this technique was to " provide evidence about the efficacy of specific health information interventions" (Farmer et al. 1998).
Collating the results of a number of small studies in the systematic review process increases the power of the conclusions reached. Lefebvre (1994), for example, contends that combining and synthesising "the results of smaller studies can provide answers to questions which have not otherwise been adequately answered by the individual results of small studies."
In this research project it was anticipated that collating a number of studies, considering the effectiveness of particular information dissemination methods, would indicate whether specific methods were consistently effective regardless of the circumstances of the dissemination.
The HLG recommend that the topic of the review "should be of direct relevance to information practitioners and have a significant body of associated literature" (Booth, 1998). This latter recommendation is the justification for the review of literature evaluating dissemination strategies in general rather than only in the specific context of a crisis, although the suspected TB incident did merit the description of a crisis. It

is also considered that providing evidence of the evaluation of information dissemination strategies in general would be of more immediate relevance to the information profession as a whole, than would be the case if the topic of the review was restricted to health information dissemination specifically.

The NHS Centre for Reviews and Dissemination (NHSCRD, 1996) recommends conducting a review in eleven stages, and the HLG retained this format in their adaptation of the technique.



(*Figure 4 adapted from NHS CRD 1996)*

3.6.3 Key informant interviews

3.6.3.1 Why interview?

In answer to the question "why interview?" Seidman (1998) contends that he interviews because he is "interested in other people's stories." Patton (1990), meanwhile, states that researchers interview informants "to collect information about events, which they have not directly observed." Fontana and Frey (1998) moreover, are of the opinion that "interviewing is one of the most common, and most powerful

ways we use to try and understand our fellow human beings." At the heart of all three statements is a belief that gathering data using the participants' own words will provide researchers with an enhanced understanding of a phenomenon.
In this project the intent in interviewing individuals is to gain a better understanding and knowledge of the process of information dissemination during the suspected TB incident. Despite being involved in the incident, as a result of my two sons' positive test results and residence in Ponteland, and thus able to observe the dissemination process at firsthand, aspects of the process still required explanation and clarification from other individuals involved in the incident. The focus of the interviews will, therefore, be to seek information about the dissemination process from the information providers' perspective. In addition, it was anticipated that the interview data would include "illustrative material to complement other material and findings" (Ackroyd & Hughes, 1992).

3.6.3.2 'Social encounters'

Interviews are social encounters and "cannot be exempted from the normal social processes that govern such encounters" (Ackroyd & Hughes, 1992). At the very heart of the encounter is a relationship of trust (Fontana & Frey, 1998). The interviewee trusts the interviewer to respect their privacy and to represent their views accurately in the research report, whilst the interviewer trusts the interviewee to respond truthfully to the questions posed in the interview. Ackroyd & Hughes (1992) argue that the very notion of the interview as a data collection method "depends very heavily upon particular cultural conventions prevalent in some types of social systems."
Thus in societies where details of a private nature are rarely discussed in public or with strangers, conducting interviews may prove to be a difficult undertaking. Bowler, (1997) for example, failed in her attempts to interview South Asian women about their experiences of maternity care when potential informants refused to discuss the topic with her. In particular, Bowler found it " extremely difficult to explain the idea of 'their views' and why these were important." In addition, although Bowler had no difficulty in contacting potential informants and indeed visiting them in their homes, she found that "research was of the public domain, visiting was of the private

domain" and the differences between these two domains accounted for the women's refusal to be interviewed.

Even when cultural conventions do encourage participation the "researcher's relationship has to be such that the informant is willing to share his or her knowledge and skills" (Gilchrist, 1992). Variables such as "age, race, gender and social class have been identified as having a bearing upon interviews" (Hughes, 1996). Gorman & Clayton, (1997) also contend that the "approach, personality and even appearance of the interviewer always has a significant effect on the quality and direction of an interview." It has been suggested (Wilson, 1996) that matching characteristics of the respondent, e.g. gender or race, with the interviewer might reduce any bias in the interview process associated with these characteristics. Matching the interviewer and respondent by characteristic, however, is not always feasible. In this particular study, interviews were conducted with both male and female respondents by a single researcher, thus matching by gender could not be achieved for all of the interviews. It is, therefore, incumbent upon the researcher to be aware of the potential for bias and to acknowledge where it may occur.

One notable area where bias might occur in interviews is where the potential respondents are children or young people, although as Porcellato et al (1999) note, "historically children and young people, who are less articulate or confident because of age, ability or culture have not been regarded as able to give their views." In this particular project child respondents will not be asked to participate in the interview phase of the fieldwork, but child respondents will be invited to participate in the final phase of the fieldwork, a questionnaire survey. Questionnaires although similar in many respects to interviews raise another distinct set of research issues.

3.6.4 Questionnaire survey

3.6.4.1 Why use a questionnaire?

Questionnaires have been described as "the most popular of all the data collection instruments employed in statistical work" (Wilson & McLean, 1994). One result of this popularity is a perception that questionnaires are also a relatively straightforward

method of data collection, whereas in fact the opposite is true. Questionnaire surveys, however, are popular because they can be administered without the presence of the researcher, in the case of postal surveys, thus eliminating the biases relating to researcher and respondent characteristics noted above. Questionnaires are also popular because, particularly in very structured questionnaires, responses are easily codified. In addition, questionnaire surveys can elicit a large number of responses relatively quickly and cheaply. By using a questionnaire survey, moreover, access can be gained to participants who might otherwise be unwilling to grant the necessary time for an interview.

One other attraction of the method for researchers is that as all respondents are asked the same question "the data collected are very unlikely to be contaminated through variations in the wording of the questions or the manner in which the question is asked" (Denscombe, 1998).

As this research project was conducted by a lone researcher, with the time and budget constraints normally applicable in these circumstances, a questionnaire survey that might elicit a large number of responses in a relatively short time-scale was an attractive proposition. In addition, as this phase of the fieldwork was intended to provide responses that could be aggregated by variables such as age and gender, a questionnaire survey was an especially appropriate data collection method.

3.6.4.2 Interpretation

Although Denscombe (1998) contends that one of the advantages of a questionnaire is that it "eliminates the effects of personal interaction with the researcher", Peterson (2000) argues that questionnaires "constitute a form of interpersonal communication, because a researcher constructs and administers questions to individuals participating in a study who in turn answer them." Wilson (1996) considers that even postal questionnaires constitute a form of interpersonal communication because "the respondent is asked to give time and application" by the researcher.

As with any form of communication, problems can arise between the sending of the question and the receipt of the answer. Foddy (1993) considers that there are four main steps in a successful question – answer sequence, and that problems can occur at each of the four steps:

1. The researcher must be clear about the nature of the information required and encode a request for this information
2. The respondent must decode this request in the way the researcher intends it to be decoded
3. The respondent must encode an answer that contains the information the researcher has requested
4. The researcher must decode the answer as the respondent intended it to be decoded

At the heart of this question – answer sequence is the act of interpretation by both the researcher and the respondent. Sudman and Bradburn (1982) advise researchers to "use words that everyone in the sample understands and that have only the meaning you intend." However, with postal questionnaires the researcher has no way of knowing whether the respondent understands the meaning intended. Foddy (1993) for example, states that "since all topics are multi-dimensional respondents can orient to a topic in either a global or a more narrowly defined fashion." A question asking about TB immunisation, for example, may be interpreted by respondents as relating to global policy, a national health programme or a specific injection. The questionnaire designer must therefore define for the respondent which of these various interpretations is sought.

Having a clear idea of the research question and conducting a pilot investigation are the main strategies that researchers are advised to adopt in order to minimise the problems associated with differences in interpretation (Sudman & Bradburn 1982, Wilson 1996). Relating questions to the research aim should ensure that superfluous information is not requested, and that the focus of the questions is consistent with the research objectives. Piloting a questionnaire survey can highlight any difficulties with interpretation, as the investigator will have the opportunity to explore with respondents their understanding of the questions as phrased.

Although interpretation is an important consideration for both designers of questionnaires and readers of research reports, researchers must also be aware that respondents do not always possess the information required to respond, but that this will not necessarily prohibit them from responding. As Foddy (1993) notes

"respondents typically do their best to answer every question put to them." Oppenheim (1992) moreover notes that "people are reluctant to admit lack of knowledge." Researchers can, however, employ strategies such as filter questions or the inclusion of a 'don't know' option to try and reduce the incidence of these empty responses.

The issues of interpretation and knowledge are also factors, which will impact upon the reliability and validity of the research findings. Reliability and validity are terms used when discussing the rigour of the research process. These terms are, however, the subject of much debate in the research community.

3.7 Rigour

3.7.1 Criteria

Every research project, whatever the approach, should be conducted in such a manner that the results of the research can be relied upon. The research process should be designed to bear rigorous appraisal by the research community. Traditionally, research was measured against criteria grounded in the tenets of rigorous scientific research. These criteria were thus developed to "control and minimize perceived sources of random and systematic error" (Zyzanski et al., 1992). The criteria, therefore, addressed concerns such as flawed sampling strategies and unreliable instrumentation. Four aspects of research were assessed:

1. Reliability
2. Objectivity
3. Internal validity
4. External validity

Reliability is an assessment of the extent to which " a measurement procedure yields the same answer, however and whenever, it is carried out" (Gorman & Clayton, 1997).

Objectivity is an assessment of the "degree of error or the level of researcher contamination relating to the data" (Glazier, 1992).

Internal validity is the measurement of the extent to which "the presumed cause really does have an impact on the presumed effect" (Bryman, 1988).
External validity is an assessment of the extent to which "findings can be generalized" (Bryman, 1988).
All of these criteria are underpinned by the positivist belief that one single reality exists, and that it can be observed and measured. Qualitative research, however, emphasises the existence of "multiple realities and multiple levels of analysis" (Glazier, 1992). Whilst some researchers in the field argue that "the very idea of assessing qualitative research is antithetical to the nature of this research" (Denzin & Lincoln, 1998), others concur with Glazier's (1992) view that "social science is not exempt from the need for mechanisms to guard the integrity of the research process." Zyzanski et al (1992) however, contend that "if rigour is defined in terms of quantitation, control of extraneous factors and objectivity, most qualitative research will fail the test." Research projects that rely on data from observation and focus group interviews, for example, cannot "yield the same answer, however and whenever, it is carried out" (Gorman & Clayton, 1997). Similarly the role of the researcher, as the research instrument in interviews or observation, renders the concept of researcher contamination difficult to apply as a measure of rigour in the research process. With regard to validity, qualitative research with its emphasis upon gaining a holistic picture is thus less concerned with the notions of cause and effect and the manipulation of variables, and more concerned with detailed description and interpretation. Generalization, moreover, is rarely the aim of qualitative research projects, which usually employ relatively small samples and thus do not seek to ensure representativeness in their sampling strategies.
As Denzin and Lincoln (1998) note, however, a number of other approaches to assess the rigour of qualitative research studies have, therefore, been proposed.

3.7.2 Other approaches

Some researchers in the field of qualitative research have taken the traditional criteria for assessing rigour above and adapted these criteria to better reflect the nature of qualitative research. Glazier (1992) suggests that rather than thinking in terms of the reliability of the research process, qualitative researchers should think in terms of its

consistency. Thus, the rigour of a qualitative research project is measured by the extent to which the project's findings are consistent with existing research in the field. Using this assessment in this study of the suspected TB incident, for example, the rigour of the research process would be open to question if the findings indicated that the residents of the community were completely satisfied with the amount of information they received during the incident. Existing research (Miller & Mangan 1983, van Zuuren & Wolfs 1991) has demonstrated that information blunters would be distressed by receiving what they considered to be too much information, whilst information monitors would be distressed by receiving what they considered to be too little information, which suggests that at least one of these groups would be dissatisfied with the information provision during the suspected TB incident. Thus a finding that all of the residents of the community were completely satisfied with the information provision would deny the existence of these two styles of information behaviour.

Miles and Huberman (1994) suggest that researchers should consider the dependability and auditability of their research where "the underlying issue is whether the process of the study is consistent, reasonably stable over time and across researchers and methods." They provide relevant queries that should be posed by the reader to assess these aspects of the research. Readers are advised to ask themselves for example if "data were collected across the full range of appropriate settings, times, respondents and so on suggested by the research questions." Gorman and Clayton (1997) contend that exposure to multiple situations "helps the researcher achieve deeper insights into the phenomenon under investigation, since it broadens knowledge of the field and opens new avenues of awareness." Research that is dependable, moreover, explicitly "describes the researcher's role and status within the site", has multiple accounts that "converge in instances, settings or times when they might be expected to", and has findings that show "meaningful parallelism across data sources" (Miles & Huberman, 1994).

Thus, in the suspected TB incident, the research account would be expected to provide reports from a variety of sources confirming meeting attendances, for example. In addition, the changing nature of the incident should be reflected in the interview data, the questionnaire responses and the documentary evidence collected from the incident.

Assessment of the auditability of a research project requires that researchers ensure that decisions made during the research are visible and verifiable through the data. In projects employing emergent sampling strategies, for example, readers of the research reports should be able to follow the process of the strategy, both in the arguments presented by the researcher and in the data. Readers should be able to follow an 'audit trail' through the data that supports the conclusions reached by the author of the report.

Traditionally qualitative researchers have rejected the notion of generalizability, or external validity, in relation to their research paradigm arguing that the rationale behind qualitative research, to gather in-depth, 'rich' description of a particular phenomenon, renders the notion of generalizability of the findings redundant. However, researchers have adapted this criteria to suggest that qualitative research should be assessed in relation to the transferability of the findings, asking whether the conclusions reached in a study have "any larger import" (Miles & Huberman, 1994). Researchers therefore seek to determine whether "the theory is applicable beyond the immediate group to similar situations, questions and problems regardless of the comparability of the demographic composition of the group" (Morse, 1999). The question here for researchers is; can the knowledge resulting from the study be transferred to other situations? Miles and Huberman (1994) suggest that readers look for "findings congruent with, connected to, or confirmatory of prior theory."

In this particular study, therefore, although the situation, the suspected TB incident, is itself unique, the theoretical underpinnings of this study in information behaviour research, for example, are applicable to other situations. Thus the findings of this study will contribute to a body of research, which can be applied to a variety of diverse situations.

With respect to internal validity Miles and Huberman (1994) suggest that a more appropriate assessment is the credibility of the research – " do the findings of the study make sense?" Beck (1993) contends, that "research is credible when the informants and also readers who have had that human experience recognise the researchers described experience as their own." Whilst Patton (1990) warns:

"The credibility of qualitative inquiry is especially dependent on the credibility of the researcher because the researcher is the instrument of data collection and the centre of the analytic process."

Miles and Huberman (1994) propose that to assess the credibility of a study, readers ask whether "negative evidence was sought" and, if found, how was it dealt with, were "areas of uncertainty identified" and have "findings been replicated in other parts of the database than the one they arose from."
The development of these alternative criteria, and the concerns they purport to address has led to the establishment of specific methods designed to illustrate the rigour of the research process.

3.7.3 Credible research

3.7.31. Triangulation

Researchers are advised to adopt specific strategies in their research projects to enhance the credibility of their findings (Creswell, 1998). Three main strategies have been developed to aid both the reader of the research report and the researcher in the assessment of the credibility of the research findings:

1. Triangulation
2. Member validation
3. Searching for negative cases

Creswell (1998) describes triangulation as a "process that involves corroborating evidence from different sources to shed light on a theme or perspective." Cohen and Mannion (1980) consider triangulation as "an attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint by making use of both quantitative and qualitative data."
Various methods of triangulation might be adopted (Patton, 1990):

Methods triangulation	"checking out the consistency of findings generated by different data collection methods"

Triangulation of sources	"checking out the consistency of different data sources within the same method"
Analyst triangulation	"using multiple analysts to review findings"
Theory/perspective triangulation	"using multiple perspective or theories to interpret the data"

Cohen and Mannion (1980) describe two further methods of triangulation:

Time triangulation	"takes into consideration the factors of change and process by utilising cross-sectional and longtitudinal designs"
Space triangulation	"attempts to overcome the parochialism of studies conducted in the same country or within the same sub-culture by making use of cross-cultural techniques."

In this study two methods of triangulation will be employed. Data relating to the information dissemination process will be gathered from key informant interviews and the questionnaire survey, triangulation of method. In addition, the interview and questionnaire data will be analysed in conjunction with documentation produced during the suspected TB incident, triangulation of sources. Thus the credibility of the findings of this study is founded in the diversity of the data collected and the variety of the sources and data collection methods employed.

No matter what method of triangulation is employed in a study, as Patton (1990) points out researchers "should not expect findings generated by different methods to automatically come together to produce some nicely integrated whole." Issues such as differing interpretations on the part of the researcher and the respondent, for example, will have an impact upon the data collected. Thus comparing data gathered during an interview, where differences in interpretation may be explored, with data collected in a postal survey, where differences will remain hidden, will inevitably highlight contradictions and anomalies between the two perspectives.

However, whilst consideration of the different perspectives may not produce a single, unified viewpoint it will provide a "deeper understanding of different aspects" of the study (Seale, 1999). Triangulation produces credible research by corroborating findings across a range of devices.

3.7.3.2 Member validation

Another strategy employed by qualitative researchers to enhance the credibility of their research findings, member validation, addresses the problems of differing interpretations noted above. Member validation produces credible research by confirming findings with respondents. Seale (1999) describes member validation as "using the views of the people on whom research has been done as a check that the account has correctly incorporated differing perspectives."
Member validation as an assessment of credible research can take a number of forms. Researchers may, for example:

1. Use researchers concepts to predict members descriptions
2. Show that the researchers account can lead to successful 'passing' as a member
3. Ask members to judge the adequacy of the researcher's account
4. Regard successful action research as a form of member validation (Seale, 1999)

The third form of member validation above, although popular with researchers, is not without its difficulties (Creswell, 1998).
Adopting a member validation strategy in this project might involve, for example, producing an interim report for the health professionals managing the incident and requesting their response, then adjusting subsequent reports in the light of this feedback. This strategy, however, assumes that the feedback provided is accurate and unbiased, with no political objective for example. In addition there is an assumption in employing this strategy that the respondents are motivated to provide reasoned feedback. In this research project, the crisis occurred some years previously and thus the incentive to reflect on the issue may not be as strong as would have been the case

previously. Thus, in this instance, member validation was not employed as a strategy to enhance the credibility of the research.

3.7.3.3 Negative cases

The third strategy suggested to enhance the credibility of qualitative research is the search for negative cases. Patton (1990) considers that "where patterns and trends have been identified, our understanding of those patterns and trends is increased by considering the instances and cases that do not fit within the pattern." Whilst, Seale (1999) contends that a "willingness to seek out disconfirming evidence, and to allow this to modify general ideas, constitutes the essence of a scientific attitude."
Searching for negative cases enhances the credibility of the research by ensuring that alternative views are considered in the final analysis. It is, for example, as important to hear from those individuals who were not satisfied with the information provision during the suspected TB incident, as it is from those individuals who were satisfied. Indeed some might argue that it is more important to consider the negative cases in a research study, as these studies may generate more useful insights in relation to the success of an initiative than might be the case if only successful cases were considered.
At the very least, searching for negative cases in a research project ensures that all possible views are considered and incorporated into the research findings.

3.8 Conclusion

This chapter has considered the methodological approach taken in this study and outlined the specific research methods employed. The multi-disciplinary nature of information studies research encompasses a wide variety of research approaches within its broad remit. A broadly qualitative research approach is considered appropriate for the research questions set for this project, which involved consideration of the dissemination effort from the perspectives of both the information providers and the information recipients. A case study approach will be taken to the study of the suspected TB incident and the boundaries of the case will, therefore be set by the geographic and temporal limitations of the incident.

Both the multi-disciplinary nature of information studies research and the conduct of case study research allow for a wide range of research methods to be employed by researchers. This research project seeks to determine the nature and extent of the existing evidence of the effectiveness of information dissemination strategies. The method selected for this phase of the project is an adaptation of a research method employed in medical research. The method, a qualitative systematic review of research literature will provide a framework upon which the subsequent phases of the research project will be founded.

As this research project aims to gather information from both information providers and information recipients the research will be conducted in two distinct phases. In the first phase the information providers' perspective will be sought in a series of key informant interviews. The aim of this phase of the fieldwork will be to determine the specific criteria set for the information dissemination process during the suspected TB incident. The aim of the second phase of the fieldwork will be to gather the information recipients' perspective of the information dissemination, and the method that will be employed in this phase is a questionnaire survey of members of the community.

The rigour of the research process is a concern for qualitative researchers. The development of criteria appropriate to the qualitative research paradigm suggests that qualitative research can be rigorous and, moreover, that specific actions taken by the researcher can enhance the credibility of the research process.

The remainder of this thesis details the specific research methods employed in this research project and the analysis of the data collected in the fieldwork.

4.1 Introduction

The first objective of this research project was to determine the existing evidence of effective information dissemination. The method used to achieve this objective was a qualitative systematic review of the research literature considering the effectiveness of information dissemination strategies. In the previous chapter the justification for employing the technique was given. This chapter now details the conduct of the qualitative systematic review employed in this project. In this research project the intent in employing the technique was to determine the nature and availability of the existing evidence of effective dissemination. In addition, this phase of the project was intended to provide a platform upon which the evaluation of the information dissemination process in Ponteland could be founded. As a *qualitative* systematic review of research literature, particular emphasis is given in this chapter to the meta-ethnographic approach adopted for synthesis and analysis of the relevant studies. The chapter commences with a description of the format of the review and the definition of the research question set for the review, followed by details of the research protocol and the search strategy employed. Conducting a *qualitative* systematic review presents some problems for the reviewer, relating mainly to the adaptation of the technique from the quantitative research domain. These problems are also considered here together with the measures taken to overcome them. The chapter concludes with discussion of the results of the review and the implications of these results for the remainder of the research project.

4.2 Review format

The NHS CRD (1996) guidelines for the conduct of systematic reviews recommend a multi- stage process:

- In the initial phase of the review the topic is selected and a panel of consultants recruited. For the purpose of this research project it was proposed that the research degree supervision team and one other individual would fulfil

the requirements with regard to the panel of consultants. It is worth noting that the supervision team represent both the information studies and health research fields, as the NHS CRD suggest that "where possible, the group members should reflect a range of views and not one particular perspective."

- In the second stage of the qualitative systematic review process the reviewer undertakes a brief literature search, to provide an overview of the issues surrounding the topic under consideration. The literature search, in this instance, forms part of the literature review conducted for the purposes of the PhD study. In addition, to providing an overview the anticipated outcome of the literature search will be the generation of sufficient information to enable a review protocol to be formulated.

- The review protocol, the third stage of the process, " specifies the pre-determined plan which the research exercise will follow" (NHS CRD, 1996). It is, however, important to ensure that the protocol "does not become a straight-jacket which prevents the review from exploring useful and unexpected issues" (NHSCRD,1996).

- The fourth phase of the review process is the systematic search of information science, health and general databases, library catalogues and the Internet using the review protocol as a guide. The NHS CRD (1996) points out that it is "important that the search for the primary studies is extensive." Boon and Stewart's review, (1998) for example, of patient-physician communication assessment instruments circulated the results, of a Medline search, to a small number of experts in the field with a request that they advise the researchers of any additional instruments that had not been included in the review. Subject experts in UNN together with the PhD supervision team will perform a similar function for this review. In view of the wide-ranging nature of the review question it is anticipated that a large variety of sources will be utilised during this stage of the process. The NHS CRD (1996) also recommend that, at this stage, key journals in the field should be hand-searched to identify articles that may have been missed in the database searches.

- Once potentially relevant articles have been identified, the fifth stage in the review process is to identify those articles that match the pre-determined inclusion and exclusion criteria. Articles, thus identified, should then be circulated to the panel of consultants for verification. The inclusion criteria draw potentially usable studies from the review of relevant titles, abstracts and keywords. The HLG review pruned 1,500 research articles deemed potentially relevant from their titles and abstracts down to less than 200 articles when assessed against the inclusion and exclusion criteria (Booth, 1998).

- After the pruning process it is then necessary to determine the quality of each study. In this review the quality of each article identified will be determined by the appropriateness of the methods employed with respect to the aims of the study and the rigour of the research process. Data informing the reader of both of these measures will be extracted from the articles in the sixth stage of the review process. It should be noted at this stage, however, that the HLG found it necessary to take "a liberal view of the quality of the studies under scrutiny to allow a complete picture of the retrieved literature" (Booth, 1998). It was anticipated that as the proposed review, would not be restricted to health information dissemination, the results of the systematic search would yield a number of quality studies.

- The seventh stage of data synthesis would, therefore, be undertaken with the hope that the results would be able to be brought together in a meaningful way.

- The production of a report, the eighth stage, is the culmination of the data collection and analysis stages of the review process. Again, the panel of consultants should be invited to assess the study for "scientific quality, content and relevance" (Booth, 1998). As this review is part of a PhD research project, this aspect of the review process is incorporated in the wider scrutiny of the doctoral thesis.

- The final stage of the review process is the dissemination of the findings of the review. Again, as this review is a component of a doctoral research project, some of the mechanisms for the publication of the research findings have already been identified. These mechanisms include poster presentations during the course of the research and the presentation of conference papers at the conclusion of the review.

The systematic review technique, although novel in the information studies field, is academically sound and is already being utilised in the field of health information. The findings of the review will provide the foundation for the subsequent evaluation of the dissemination process during the suspected TB incident. Issues raised during the synthesis and analysis of the review will be used to guide the topics covered in the key informant interviews and the questionnaire surveys.

4.3 Research Question

4.3.1 Crisis situations

To conduct a systematic review successfully, the research question should be well defined at the outset. Thus, although the focus of this research project is information dissemination in a crisis situation, an exploratory literature review highlighted the paucity of research considering information dissemination in these situations. It was found that research in this area concentrates primarily upon management issues relating to the provision of information during a time of crisis. Studies have considered, for example, the potential role of the public library service in both natural (Pijnenburg & van Duin, 1990) and man-made disasters (Broughton, 1989), the difficulties of risk assessment and decontamination from a chemical spillage (MacLehose et al, 2001), and the role of information systems during an agricultural disaster (Pelletier & Msukwa, 1990). One researcher, however, noted, that "most of the time crisis situations turn out to be, to a large extent, information and communication crises" (Pijnenburg & van Duin, 1990).

As a result of this exploratory literature review, the research question for the systematic review did not restrict the search to information dissemination in specifically crisis situations, as this would have been too narrow a focus and would have rendered the proposed systematic review unfeasible in terms of the volume of literature available in the field.

4.3.2 The PIOC Framework

In medical research, the research question for a systematic review can be defined using a PIOC framework (Booth, 2000c). This framework is employed when the review seeks to ascertain the effectiveness of an Intervention delivered to a Patient or Population judged by a Comparison of the Outcomes of the studies. The research question for this review was loosely based upon this framework. The exploratory literature review for this research project highlighted that the term dissemination is frequently used to signify information distribution amongst professional/academic groups. This was not, however, the only population group that this review sought to consider. In the review, therefore, the term was taken to include the distribution of information to any group of users, or potential users. Similarly, no boundaries to the age or sex of the populations sought were defined. Incidents, such as that experienced in Ponteland, affect entire communities therefore limiting the review to specific ages or sexes would render the findings of the review incomplete.

In medical terms, the intervention is defined as a procedure, agent or a manoeuvre that is administered to the population (Booth, 2000c). In the terms of this review, the intervention is the dissemination method employed e.g. newsletters, meetings or e-mails. In many situations, however, more than one dissemination method is employed to deliver information to the intended audience (Marcus et al., 1998). Accordingly, this review was not limited to identifying research assessing the effectiveness of one particular method of dissemination. It was anticipated that synthesis of the results of studies evaluating a number of methods would lead to identification of the most effective methods in a variety of situations, which could then be combined to produce an effective information dissemination strategy.

There are a number of potential outcomes from studies concerned with the effectiveness of an information dissemination method, which are determined by the

definition of effectiveness employed for the study. One such outcome measure is whether a particular method of dissemination is cost – effective, whilst other research measures the effectiveness of the various technologies employed to deliver the information. Other outcomes that might be assessed are changes in the behaviour, attitudes or knowledge of the target population as a result of the information disseminated, such as increased levels of physical activity (Marcus et al., 1998), knowledge of political issues (Johnson, Briama & Sothirajah, 1999), satisfaction with police performance (Winkel, 1991) or participation in local government recycling initiatives (Read, 1998).

This review sought to determine the effectiveness of the dissemination from the perspective of both the provider and the recipient and thereby, produce a holistic assessment of the process. Studies, which were solely concerned with effectiveness in relation to cost or technology outcome measures were, therefore, excluded from the review, as both of these measures are relevant only to the information provider and not the recipient. The outcomes sought were therefore only those that related to changes attributable to the information recipient.

The final component of the PIOC framework, comparison of the intervention, is optional and is sometimes substituted with a definition of the research design sought. In both instances the intent is to identify, prior to the search, the type of studies that are appropriate for the question posed. Again in medical research, systematic reviews seeking to ascertain the effectiveness of an intervention generally stipulate experimental, quantitative research designs particularly randomised controlled trials, as the most appropriate for inclusion (Lefebvre, 1994). This study design is, however, rare in information studies research. Also, as the research question already stipulates that consideration of the strategy by the user must be incorporated, a range of research designs are required. Thus, the research question in this instance does not limit the type of studies that would be sought but rather, limits the studies to those that incorporate a user perspective in the process.

Using the framework and the exploratory literature review, the research question for the review was, therefore, defined as follows:

"To determine, for any population, the effectiveness of various information dissemination methods from the perspective of both the user and the provider of the information."

4.4 Review Protocol

4.4.1 Inclusion and exclusion criteria

Defining the research question is, however, only one stage in the review process. Prior to embarking upon the search for literature a review protocol should be drawn up (NHSCRD 2001). The review protocol specifies the pre-determined plan that the research exercise will follow. Using the definition of the research question, the protocol develops the specific inclusion and exclusion criteria that will be applied to the retrieved items. In this specific review, as the technique is a particularly new approach to research in information and library science, the potential number and quality of reported studies in information dissemination is difficult to assess prior to the execution of the search. The inclusion and exclusion criteria are, therefore, purposefully general at this stage with the option to specify more specific exclusion criteria during the search should the need arise.

4.4.2 Exclusion criteria

Some of the exclusion criteria set for this review have already been mentioned:

1. *Studies solely concerned with an evaluation of the cost-effectiveness of the dissemination strategy will be excluded from the final analysis*
2. *Studies solely concerned with evaluating the effectiveness of the technology employed in the dissemination strategy will be excluded from the final analysis*

Technology can and does feature prominently in dissemination research, therefore, to ensure that the studies retrieved by the search would provide results that were relevant for the remaining phases of the project two further exclusion criteria were set:

3. *Studies in which technology is an important element of the dissemination strategy will be excluded from the analysis if the study is*

based in a location where technological capabilities are not comparable to those present in the U.K.

4. *Studies conducted prior to 1990 in which technology is an important element of the evaluation will also be excluded from the analysis.*

In both cases it was considered that excluding studies in these categories would ultimately strengthen the review findings, by ensuring that the studies selected for synthesis and analysis were comparable technologically both with each other, and with current practice in the U.K. and Western Europe.
One final exclusion criteria was set for the review protocol. This review did not seek to answer the question "*what* information is most effectively disseminated?" but instead to answer "*how* is information most effectively disseminated?" The remaining criteria was, therefore:

5. *Studies solely concerned with the content of the information dissemination process will be excluded from the final analysis.*

Studies matching any of the five criteria would be excluded from the remainder of the review process, however, the review protocol also specifies criteria against which retrieved items should be assessed for inclusion in the review.

4.4.3 Inclusion criteria

The exclusion criteria for the review relate to technology and content. The inclusion criteria, on the other hand, relate mainly to methodological issues. As mentioned above, one of the prime elements of the research question was that the research retrieved by the search should include a user perspective in the evaluation. The first inclusion criteria set was, therefore:

1. *The research methodology of each study must incorporate the viewpoint of the users of the information in the evaluation process.*

The form that this consideration was to take was not defined at this stage. Qualitative research utilises a variety of methods, with no one method considered appropriate for

every situation (Gorman & Clayton, 1997). However, to ensure that the methods selected were commensurate with the research aims of each retrieved study, a further inclusion criteria was set:

2. *The studies retrieved should contain a clear statement of the research aims and methodology*

The third inclusion criteria set for the review related to another aspect of the review process, namely, language bias. Bias is a particular concern for individuals conducting a systematic review, as the results of the review can be prejudiced by, for example, publication bias whereby studies generating positive results are more likely to be published than those generating negative or inconclusive results. Measures that can be adopted to combat possible bias are generally incorporated in the search strategy, however, language bias is a factor that can be accommodated in the review protocol. Language bias is the suggestion that papers and articles written in English are more likely to be published than articles and papers written in other languages. This type of bias can be particularly evident in topics where the bulk of research papers are published in key journals. In order to combat any potential language bias in this review, the final inclusion criteria was:

3. *Reported studies in non-English language publications which include an English language abstract and conform to all other criteria will be included in the final analysis.*

These were the initial criteria set for this review, and together with the research question previously defined, form the review protocol (See Appendix 2). The next stage of the systematic review process is construction of the search strategy.

4.5 Search Strategy

4.5.1 Sources

A multiple method search strategy was employed in this review, both as a reflection of the cross-disciplinary nature of the topic and also as good practice in the systematic review process (Helmer et al., 2001). A number of sources were consulted at the outset to facilitate the identification of potentially useful material. Due to the nature of the topic there are no key journals in which the bulk of the relevant research will be published, thus a broad range of resources must be searched to identify potential studies. Database directories and subject experts at UNN were consulted to aid the identification of potentially useful resources. Sixteen databases (See Appendix 3) were highlighted by this process. In addition, eight web-based information studies and research register resources were also identified through this process as potential sources of relevant studies.

4.5.2 Search terms

The comprehensiveness of a database search depends upon the search strategy employed. A search strategy aims to minimise the non-retrieval of relevant documents and retrieval of non-relevant documents, whilst also maximising the retrieval of relevant documents. One of the first considerations in designing a search strategy is to have "a clear definition of what is being sought" (Matthews et al, 1999). This review sought to identify evidence of the effectiveness of information dissemination strategies designed to inform an audience about a current issue. As noted earlier (See Chapter 2) however, the definitions of information and dissemination are numerous and varied. Indexing on the sixteen databases searched was, therefore, inconsistent. Also, much of the research in this field relates specifically to technological concerns. The combination of these two factors meant that the search strategy adopted needed to be flexible.

The first stage of the search strategy was, therefore, to identify possible search terms using both database thesauri and consultation with subject experts at UNN. The reviewer found, for example, that whilst dissemination is not an index term on the

Library and Information Science Abstracts (LISA) database, the phrase information dissemination is a subject term. The Educational Resources Information Center (ERIC) database, on the other hand, uses the phrase information dissemination as a related term to the broader term Communication and also uses the term Diffusion (Communication) to index material. This stage of the search strategy ultimately resulted in the production of a list of possible search terms (See Appendix 4).
The next stage of the search strategy involves conducting pilot searches to evaluate the relevance of the terms already identified.
A pilot search of the ERIC database using the search terms Communication OR Diffusion (Communication) OR Information Dissemination retrieved 9802 potentially relevant records. Combining this search with the search terms Use studies OR user needs (information) OR user satisfaction (information) reduced the number of relevant studies to 625. This pilot strategy was adapted using comparable index terms specific to LISA and resulted in the identification of 3172 potentially relevant records. All of the references retrieved in the pilot searches were marked and displayed with the abstract and subject headings. The subject terms were then examined to highlight possible headings that could be usefully included or excluded to further refine the search strategy. This resulted in the inclusion of the more useful term evaluation as a search term in the ERIC database.

4.5.3 Bias

Adoption of a multiple method search strategy is an important factor in overcoming possible publication bias in any review of literature. Publication bias, whereby studies producing positive results are more likely to be published than those with negative outcomes is a particular concern for systematic reviewers, as failure to address possible bias in the review process can lead to the production of positively skewed results. As well as employing a multiple method search strategy, another method that can be employed to overcome possible publication bias, is to check registers of research projects against database records to identify unpublished research. Due to the nature of the topic in this review, the range of databases consulted and time constraints this strategy required some adaptation for this particular review. The strategy adopted was therefore to use research registers to identify completed relevant studies and details of these studies were requested from the designated authors.

Similarly, University web sites were used to highlight current research projects in the general area of the topic, and the researchers contacted with a request for more information regarding the project.

One other type of bias requires consideration at this stage, geographical bias, where research located in particular areas is potentially less likely to be published in the prestige journals. At the outset, of this review it was unclear where relevant studies might be located, therefore, searches were not limited by country of origin to overcome this potential bias, although it is acknowledged that the third and fourth exclusion criteria set for the review (Section 4.4.2) would, in themselves, bias the search results to a degree in this respect. Booth (2000b) moreover, contends that "so many biases are associated with the uptake of research findings that it is artificial to single out just one or two."

4.6 The Search

Ultimately searches were conducted on all sixteen databases (See Appendix 3) using appropriate terms for each database from the list (See Appendix 4). Duplicate records were removed, where possible, prior to printing of the titles and abstracts of each retrieved record. 3044 potentially relevant records were retrieved. Checking the details of each record against the pre-determined inclusion and exclusion criteria reduced the potentially relevant records to 169 papers.

In health research a technique called the 'QUORUM statement' has been developed "to provide readers with information on searches, selection, validity assessment, data abstraction, study characteristics, quantitative data synthesis and trial flow" (Moher et al., 1999). The developers of the statement suggest constructing a flow diagram to provide "information about the progress of randomised trials throughout the review process from the number of potentially relevant trials identified, to those retrieved and ultimately included" (CONSORT, [n.d.]). Although this technique was developed for systematic reviews of randomised controlled trials, the flow diagram can also be usefully employed in qualitative systematic reviews (See Appendix 15 for the flow diagram constructed for this review).

Consideration of the studies retrieved in the search highlighted a conflict between the aim of the review and the review protocol. The protocol stated that relevant studies

should incorporate both the provider's and the recipient's views on the effectiveness of the dissemination strategy. It was apparent from the retrieved studies that this was not a practical proposition. This review sought to retrieve research concerning the effectiveness of dissemination methods. The problem was, however, that the user or recipient of information is not in a position to determine the effectiveness of a strategy. The strategy's effectiveness can only be determined in relation to criteria, which are set by the information provider and generally unknown to the recipient. The measurement of effectiveness on the other hand e.g. a change in attitude, is specific to the user and can be determined from a user survey as part of the research design.
The review protocol was, therefore, amended to become:

This review seeks to determine, for any population, the effectiveness of various information dissemination methods, from criteria set by the information provider, which relate to the information recipient and are measured by a user survey.

From the set of 169 records, 16 studies were found to conform to all of the inclusion and exclusion criteria now set for the review. A further two relevant studies which also conformed to the inclusion and exclusion criteria were identified from a hand search of the most frequently occurring journal, *Patient Education and Counselling*, from 1980 – 1999. In a list of the authors of relevant studies only one name appeared more than once. This author was contacted with a request for a CV to allow a review of their publication lists and ongoing research. This is an accepted method to improve the recall of the original search strategy (Booth 1999). Unfortunately in this instance the e-mail address provided on the most recent publication proved to be incorrect and efforts to identify the correct address proved unsuccessful.
Two studies, one published in French and another in German, were retrieved as potentially relevant, but upon translation neither were appropriate for inclusion in the final synthesis and analysis. Similarly, contacting authors of current and recently completed research projects did not produce any new relevant studies for inclusion in the review. References of the papers included in the systematic review were searched to identify any other potentially relevant studies, and two further studies were discovered by this method.
Twenty studies were, therefore, included in the next stage of the review (See Appendix 5).

4.7 The Studies

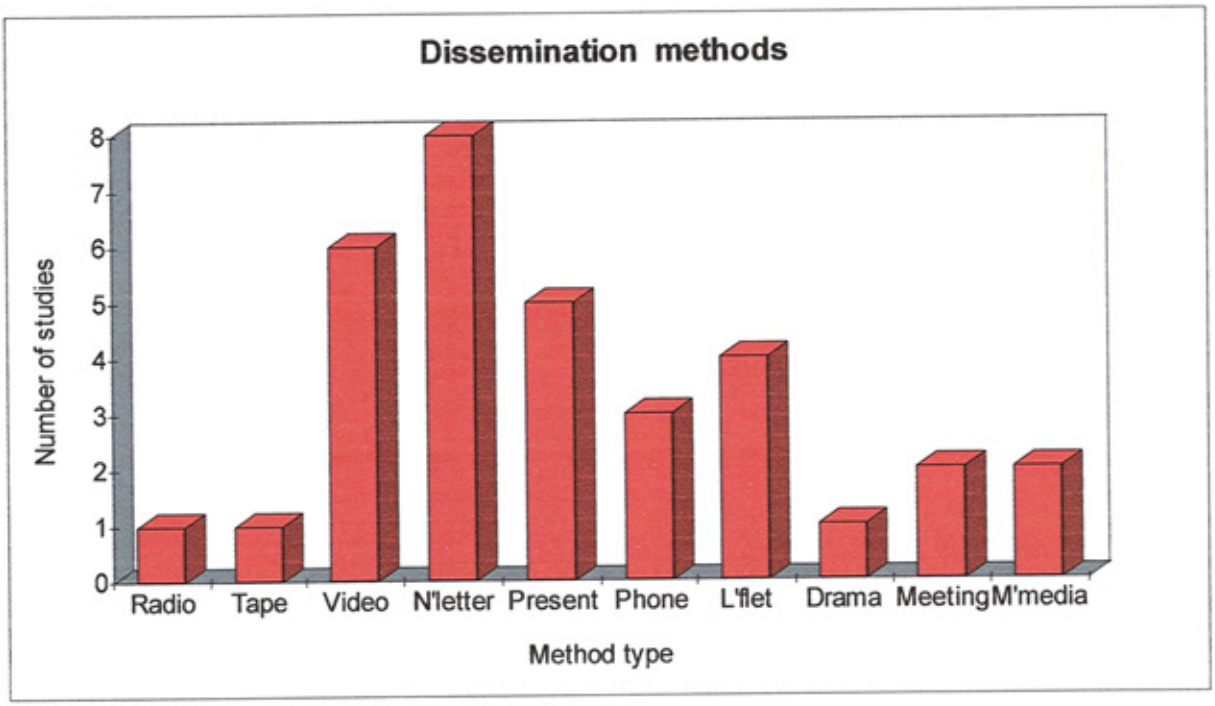
4.7.1 Topics

Despite the search for relevant studies being deliberately general in scope, only two of the twenty relevant studies were not health related. This is possibly due to the current emphasis within health research upon prevention rather than cure and on the role of the patient as a consumer as noted in Chapter 1. Adoption of this role highlights information, and the communication of information, as vital elements in the partnership between doctor and patient. Health professionals are seen as the prime source of information for patients about their condition and treatment (NHS Executive, 1998).

The two non-health studies retrieved were conducted to evaluate the effectiveness of newsletters as a means of providing information to single parents (Nelson, 1986) and to assess the effectiveness of a range of methods employed to inform staff during the incorporation of a college into a university (Whittaker et al., 1994). The remaining eighteen studies encompassed a range of health issues. Over half of the studies related to health promotion initiatives including cancer prevention, (Attwood et al.1991, Lechner & De Vries 1996, Schofield, Edwards & Pearce 1997, Rimer et al. 1999) AIDS awareness, (Yoder, Hornik & Chirwa 1996, McGill & Joseph 1997) healthy eating, (Rasanen, Ahlstrom & Rimpeka 1974, Bush & Henderson 1977) infant car seats, (Tietge, Bender & Scutchfield 1987) tobacco use, (Brink et al. 1995) and addiction counselling (Turner, Martin & Cunningham 1998). Six of the remaining seven studies dealt with the provision of information regarding specific medical conditions to patients (Browner, Preloran & Press 1996, Luck et al.1999, Graham et al. 2000) or to health professionals, (Sox et al.1984, Bazyk & Jeziorowski 1989, Brunham et al.1992) whilst the final study was an evaluation of the dissemination of information to patients about a hypothetical clinical trial (Llewellyn-Thomas et al. 1995).

4.7.2 Dissemination methods

The twenty studies employed a variety of dissemination methods to inform their target populations, ranging from live presentations (Sox et al.1984) to an interactive computer program (Llewellyn-Thomas et al.1995). Eight of the studies evaluated a single dissemination method, eleven compared the effectiveness of two methods and the remaining study (Whittaker et al. 1994) aimed to determine the most effective methods from the six employed to inform employees during a period of organisational change.



(Figure 5)

The chart above displays the range of methods used to disseminate information in the studies. As some of the studies used more than one dissemination method the figures given above do not correspond exactly to the number of studies.

The review protocol deliberately did not define particular populations that the relevant studies should serve. The populations of the retrieved studies were, therefore, diverse. Five of the projects disseminated information that was, or was considered to be,

applicable only to a female audience i.e. pregnant women and new mothers (Rasanen, Ahlstrom & Rempeka 1974, Bush & Henderson 1977, Tietge, Bender & Scutchfield 1987, Browner, Preloran & Press 1996, Graham et al. 2000). The remaining fifteen studies included both male and female respondents in their population samples. Participant ages, where indicated, were also varied and ranged from 13 years of age (McGill & Joseph 1997) to 88 years of age (Atwood et al.1991).
The effectiveness of the dissemination methods was evaluated in relation to at least one of three outcome measures:

1. An increase in the respondents knowledge of the particular health issue to which the dissemination related
2. A change in the respondent's attitude e.g. reduced anxiety, towards the health issue or organisational change
3. A change in the respondent's behaviour e.g. compliance with cancer screening tests.

No specific research designs were stipulated for relevant studies other than the requirement to include a user survey. The research designs employed in the twenty studies therefore, encompassed a wide range and included such diverse designs as randomised controlled trials (RCT's) and straightforward before and after studies. Although all of the studies incorporated a user survey in their research design, the form that this took varied throughout the studies. Nine of the studies conducted questionnaire surveys of the information recipients (Sox et al. 1984, Bazyk & Jeziorowski 1989, Atwood et al.1991. Brunham et al 1992, Brink et al 1995, Lechner & De Vries 1996, Schofield, Edwards & Pearce 1997, Luck et al 1999, Graham et al 2000), five of the studies gathered data by interviewing recipients (Rasanen, Ahlstrom & Rimpela 1974, Bush & Henderson 1977, Yoder, Hornik & Chirwa 1996, Turner, Martin & Cunningham 1998, Rimer et al.1999), four studies employed both interviews and a questionnaire survey, (Nelson 1986, Whittaker et al 1994, Llewellyn-Thomas et al 1995, McGill & Joseph 1997) whilst the remaining two studies both coupled observation of their target audience with either a questionnaire survey (Tietge, Bender & Scutchfield 1987) or an interview (Browner, Preloran & Press 1996).

The research designs employed in the relevant studies reflected the variety of outcomes sought by the researchers. Researchers seeking to identify an increase in knowledge might employ a pre and post test design, with individuals randomised to groups who received information via the method being evaluated, or groups who received information in the normal manner. Researchers seeking to identify a change in behaviour, on the other hand, might employ a case study design incorporating interviews with and observation of respondents.

In systematic reviews of quantitative research, hierarchies of evidence aid reviewers when assessing research reports. The results of particular types of research design e.g. randomised controlled trials are more heavily weighted in the final analysis than other research designs which are considered to be less rigorous. These hierarchies are also used to establish a threshold, whereby research designs such as observational studies fall below the threshold as their results are considered to be less valid than those of other studies therefore they are not considered in the final analysis.

The relevant studies in this review did not all comprise research conducted at the highest level of acceptable evidence. As the hierarchies of evidence relate in the main to quantitative research study designs their relevance to qualitative systematic reviews is open to debate. However, in relation to the research questions posed and the outcomes sought the study designs were concurrent with recognised practice in the information studies field.

Extracting this key data from the studies confirmed their suitability for inclusion in the next stage of the review.

4.8 Quality Assessment

4.8.1 Quality

Prior to synthesis and analysis of the relevant studies one final assessment of the studies remained to be made. Each study was assessed with respect to the credibility of the research and those of the research report. The findings of a systematic review can only be as rigorous as the studies upon which the review is based. The need for and definition of criteria for the assessment of qualitative research is the subject of much debate in the research community (Seale 1999, Popay, Rogers & Williams 1998, Denzin & Lincoln 1998, Miles & Huberman 1994). Assessing the quality of

qualitative research using measures appropriate for quantitative research studies fails to address differences between the natures of both research paradigms. Despite the absence of agreement over the form that any assessment should take, increasingly qualitative researchers acknowledge the need for some type of assessment of qualitative research studies (Popay, Rogers & Williams 1998). Miles and Huberman (1994) note, for example, that some accounts are better than others and qualitative researchers should not consider their work unjudgeable, whilst Seale (1999) agrees that quality does matter in qualitative research, but it is a somewhat elusive phenomenon.

As the hierarchies of evidence employed by quantitative researchers do not readily transfer to systematic reviews of qualitative research, some other form of assessment must be used.

4.8.2 Checklist

Although restrictive, checklists have been utilised to provide an indication that assessed studies conform to some pre-defined criteria of quality (Booth, 1998). Barbour (2001) however, cautions that "although checklists have undoubtedly contributed to the wider acceptance of [qualitative] research methods, they can be counter-productive if used prescriptively." In this review a checklist was constructed to aid in the assessment of the quality of the studies (See Appendix 6). The checklist was adapted from questions posed by Miles and Huberman (1994) that were intended to aid reflective practice for qualitative researchers, and the Internet Detective (n.d), a tool intended to be used to evaluate the quality of networked information. This checklist was designed to assess each study in three specific areas: -

1. The authority of the research – *was it of sufficient merit to allow reliance upon the accounts?*
2. The auditability of the research – *was the process of the research consistent with the principles of rigorous qualitative research?*
3. The credibility of the research – *are the conclusions reached a true reflection of the study's findings?*

It is acknowledged that these criteria are not in any way exhaustive with regard to definitions of quality particularly relating to qualitative research. Rather, the criteria reflect Seale's (1999) view of research as a "craft skill" and, therefore, relatively autonomous from the need to resolve philosophical or epistemological debates. The questions posed by the checklist were an attempt to assess whether the research had been conducted in a manner consistent with the definition of qualitative research as a craft.

4.8.3 Review panel

Each member of the review panel was furnished with the checklist and the relevant studies with a request to independently assess the same. A joint meeting of the three panel members and the reviewer was then convened to discuss any issues arising from the quality assessment. In general, the panel confirmed that the twenty studies were of sufficient merit to allow reliance upon the accounts. The wide range of experience within the panel was particularly beneficial in resolving any concerns expressed by individuals, for example, in respect of the authority of particular journals.
The panel members were, however, concerned about the appropriateness of the checklist in relation to the auditability and credibility of the research.
It was felt that these criteria were difficult to assess in some of the studies as presented. After some discussion it was accepted that there was sufficient information in each report to allow an assessment of the conduct of the research. It was acknowledged and accepted that this did require some suspension of epistemological concerns. The final assessment of the panel was that the twenty studies were conducted in a manner consistent with the definition of qualitative research as a craft. All twenty studies were, therefore, included in the final synthesis and analysis phase of the review.

4.9 Synthesis and analysis

This systematic review aimed to determine the effectiveness of information dissemination strategies. At the outset it was anticipated that collation of the reported results would highlight the most effective method of dissemination. Two factors, however, prevented this from being the case. The first factor was the definition of

effectiveness employed for the evaluations, and the second was the difficulty experienced by researchers in attributing changes in knowledge or behaviour to the particular method being evaluated.

In accordance with the protocol, all of the studies reviewed identified changes in the information recipient as the primary measure of effectiveness of the dissemination method. The changes anticipated and assessed by the researchers, however, ranged from the relatively straightforward change in knowledge / understanding looked for in eight of the studies, to a discernable change in attitude in a further six studies and an actual change in behaviour in the remaining six studies. The determination of effectiveness had, in a number of studies, a direct impact upon the perceived success of the project. Thus, in one study although the desired outcome, a change in behaviour as a result of the particular information dissemination, was not identified, a change in attitude was detected in one group of participants. The conclusion reached, however, was that the touch screen evaluated in the study conferred no additional benefit to that provided by an information leaflet (Graham et al., 2000).

Similarly, another evaluation of a dissemination strategy aiming to influence teachers and administrators readiness to adopt a tobacco prevention programme was not considered effective. This conclusion was reached, despite an increase in administrators' understanding of the programme being directly attributable to one element of the strategy (Brink et al.,1995).

Illustrating the second factor, in a study where there was an already high compliance rate with an anticipated behaviour, in this instance child safety seat usage, and widespread diffusion of relevant information from other sources, the researchers were unable to identify significant behaviour changes in the target group that could be attributed to the specific dissemination strategy (Tietge, Bender & Scutchfield, 1987). This problem is particularly evident in large-scale information studies. Thus, an evaluation of a radio drama concluded that, "while the general population improved in the accuracy of its knowledge of AIDS and in its awareness of being at risk, these changes could not be linked to listening to the radio drama alone" (Yoder, Hornik & Chirwa, 1996). Again, a survey of recipients of a nutrition information pamphlet concluded that the data suggested the pamphlet reinforced existing knowledge (Bush & Henderson 1977).

In collating these findings it became apparent that it was not possible to combine the results of the studies as the findings were not directly comparable in this manner.

Synthesis and analysis of the studies required the adoption of a different perspective, looking beyond the results to consider the underlying factors determining effective dissemination.

4.10 Meta-ethnography

4.10.1 An outline

In general, systematic reviews previously conducted have been concerned with primarily quantitative research studies. Synthesis, in these cases, is normally achieved by aggregation of the appropriate statistical data. Synthesis of qualitative research and problems encountered with the process has received scant attention in the scholarly press. This may be due, in part, to a reticence within the field with respect to discussion of the analysis of qualitative data in general. Miles and Huberman (1994) noted, for example, that some qualitative researchers consider analysis to be an art form and insist upon intuitive approaches to it, an attribute clearly at odds with the systematic review technique that aims to be objective in its interpretation and reproducible in its conclusions. Miles and Huberman's (1994) call for methods of analysis that are credible, dependable and replicable in qualitative terms, suggest that this reticence has at least been recognized.

Qualitative data analysis generally entails reducing the volume of the data collected by categorising and then making connections between the categories. A number of approaches have been developed to facilitate analysis from multiple cases. Yin (1994) suggests that replication logic should be applied, whereby convergent evidence is sought regarding the facts and conclusions for each case, then the conclusions are considered to be the information requiring replication by the other cases. Denzin and Lincoln (1998) advocate deconstructing prior conceptions of a case, then bracketing instances together and identifying the essential elements. The most common approach to qualitative data analysis, however, has been to cluster data or cases into families or groups sharing characteristics. All of these approaches, however, assume a common structure to the cases being analysed. The relevant studies retrieved in this qualitative systematic review, however, were conducted by different researchers with diverse research aims, and were not structured in such a way that they were readily comparable.

One strategy overcomes these problems whilst retaining the essence of qualitative data analysis, and adhering to the tenet of replicability at the heart of the systematic review process. The strategy, meta-ethnography, was developed by Noblit and Hare (1988) and is intended to be a "rigorous procedure for deriving substantive interpretations about any set of ethnographic or interpretive studies." Meta-ethnography aims to synthesise interpretations across multiple studies and bears initial comparison with the meta-analysis conducted in quantitative systematic reviews. Noblit and Hare (1988) however assert that any similarity between the two approaches "lies only in a shared interest in synthesising empirical studies." Meta-ethnography does not attempt to aggregate the findings of numerous studies, but aims instead to interpret the multiplicity of their findings. The initial phases of a meta-ethnography adhere to the first stages of the systematic review process i.e. selection of the topic and deciding what is relevant. The key elements of the meta-ethnographic process are, however, the determination of the relationships between the studies, the translation of the studies into one another and the synthesis of these translations. To highlight the relationships between studies Noblit and Hare (1988) suggest creating a list of key metaphors, phrases, ideas and concepts used in each account and juxtaposing them. Translation is the vehicle used to allow comparisons to be made between the key metaphors. Whilst translations are one level of meta-ethnographic analysis, a second level of synthesis is possible by analysing types of competing interpretations and translating them into each other.

4.10.2 Key concepts

The core of the meta-ethnographic approach is the selection of the key metaphors from each account. Reading the accounts is, therefore, a vital stage of the process. The focus in reading the accounts is on the key concepts, themes and metaphors that the authors employ to explain their studies. This method of synthesis is an interpretive process and it is important to acknowledge that the report produced represents one reading of the accounts; other authors with dissimilar interests may read the accounts differently. The focus of the reading in this review was, therefore, identification of the elements of an effective dissemination strategy. The reading of these accounts would, it was anticipated, produce a list of the factors impacting upon the information

dissemination process. The factors extracted from the review studies are listed in Appendix 16 together with supporting narrative from the accounts.

One of the first factors highlighted by this process was noted in the initial attempt to synthesise the studies; the variety of the measures of effectiveness employed in the research. These measures, therefore, constituted the first set of concepts extracted from the accounts. Similarly, problems associated with attributing changes to the specific method of dissemination were noted and grouped together within the term evaluation.

Another distinct set of ideas extracted from the accounts related to the theme of knowledge acquisition. Thus, the concepts of an individual's need for new knowledge and their awareness of knowledge sources were highlighted and, particularly in studies where a change in behaviour was sought, the individual's willingness to change as a result of knowledge acquisition were also noted.

Linked to this last point, in a number of the studies, was the idea of the relevance of the material disseminated as perceived by the target audience. So, for example, the more relevant the individual perceived the information to be to their situation the more effective the dissemination process would be. Similarly, and in particular with newer technologies the ability to interact with the information was an important facet of the process. Underlying these and the previous concepts, however, is the need for an understanding of information seeking styles. Miller and Mangan's (1983) two styles of information seeking, *monitors,* who actively seek out information when threatened with an aversive event, and *blunters,* who ignore the event by distracting themselves, have obvious implications for the effectiveness of any information dissemination strategy.

Barriers and constraints to effective dissemination were noted in a number of the studies. They tended to be either cultural in nature, for example taboos regarding sex, or socio-economic, for example education levels.

The final concept highlighted, related to the information source itself and whether the information disseminated was founded upon existing research, and therefore, reinforced the recipients existing knowledge.

Extracting these concepts from the studies illustrated that the accounts were comparable and that synthesis and analysis was achievable. The next stage of the meta-ethnographic process is, therefore, translation of these key concepts. Noblit and

Hare (1988) describe translation as "an especially unique synthesis because it protects the particular, respects holism and enables comparison."

4.10.3 Translation

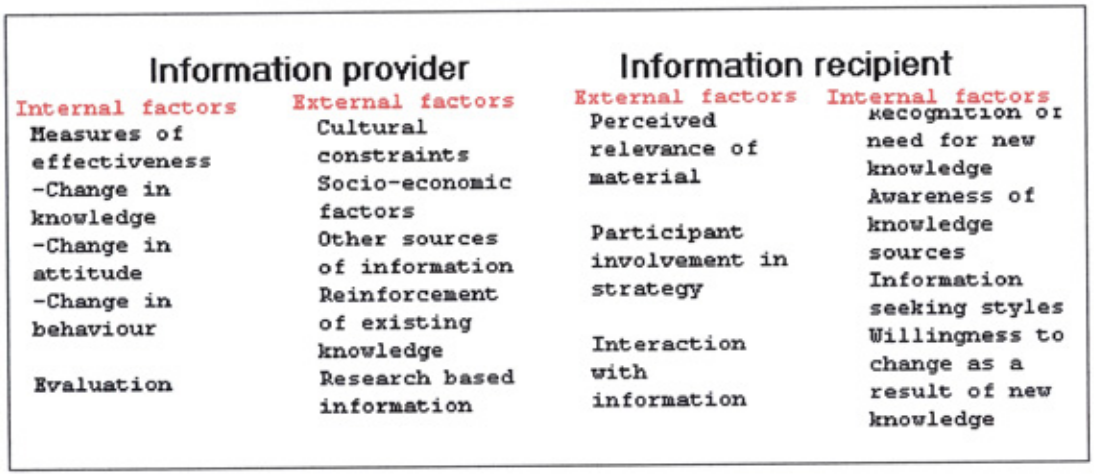
For evaluators, the purpose of the qualitative synthesis is to identify and extrapolate lessons learned (Patton 1990). The first phase of the synthesis identified the factors relating to the effectiveness of the dissemination strategies. The real contribution of the synthesis, however, is in determining how the factors fit together and translate into effective dissemination.

The first step in this process was, therefore, to determine how the factors highlighted relate to each other with regard to effective dissemination. There are two parties to the dissemination process, the information provider and the information recipient and it was in relation to these two roles that the factors were divided. Thus, the concept of information seeking style was particular to the information recipient, whilst the measures of effectiveness were specific to the information provider. Listing the concepts in this manner clarified that within each category a further two categories existed; the list could be further classified into internal and external factors for both the information provider and the information recipient.

The recipient's recognition of the need for new knowledge, for example, was internal to that individual, whilst evidence of their involvement in any dissemination strategy was readily available to the information provider. On the part of the information provider, although the cultural constraints and socio-economic barriers to effective dissemination were applicable to any information dissemination, the evaluation process was specific to their particular strategy.

Displaying the factors diagrammatically illuminates these divisions. (See figure 6)

Dissemination - Factors



(Figure 6)

The diagram displays how the factors relate to each other, but to translate these factors into effective dissemination it is necessary to determine the pattern behind the relationships.

4.10.4 Finding the pattern

To find the pattern it is necessary to consider the theories underpinning the studies. All of the studies are founded upon at least one of the following three theories:

- Diffusion of innovation
- Social cognitive theory
- Social marketing

Diffusion is the process "by which an innovation is conducted through certain channels over time among the members of a social system" (Rogers 1995). The four elements of the process are:

1. The innovation – which may be an idea, a practice or an object
2. The communication channel – the means by which the information about the innovation is transmitted and exchanged

3. The time – the characteristics of innovation adopters are studied in relation to the stage in the diffusion cycle at which they adopt the innovation
4. The social system – a set of interrelated units e.g. the families in a village, the staff in a school, within which opinion leaders can influence members behaviour and attitudes towards the innovation

Social cognitive theory embraces the four elements above but also distinguishes between the acquisition of knowledge about an innovation and adoption of the innovation. An important aspect of this acquisition process is the concept of modelling, whereby individuals who adopt innovations early serve as demonstrators to those who are uncertain of the benefits of the innovation. Technologies, such as video, have an important role in this modelling process. Modelling is also important in the adoption process. The decision to adopt an innovation is governed by a number of factors such as the environment in which the innovation occurs, the influence of incentives to adopt and the complexity of the innovation as perceived by the adopter. A negative reaction towards an innovation by early adopters, for example, may discourage other members of the social system from adopting.
Whilst the adoption of an innovation is an *element* in both the diffusion of innovations and social cognitive theory, changing behaviour i.e. adopting new practices is the *goal* of social marketing. The social marketing process is also composed of four elements:

1) Market analysis
2) Market segmentation
3) Market strategy
4) Evaluation

In common with other forms of marketing consumer orientation underpins the process. The focus of any social marketing campaign is upon knowing the environment (market analysis), targeting the intended audience (market segmentation), planning an appropriate campaign (market strategy) and evaluating the results.

As the three theories are not mutually exclusive and share many characteristics, a number of the studies included elements of more than one theory in their research design and evaluation.

Consideration of the factors displayed in Figure 6, in relation to the theories outlined above, highlighted that no one factor was crucial for effective dissemination. Indeed, it was not possible to create a hierarchy of factors because it is the combination of factors that is important for effective dissemination.

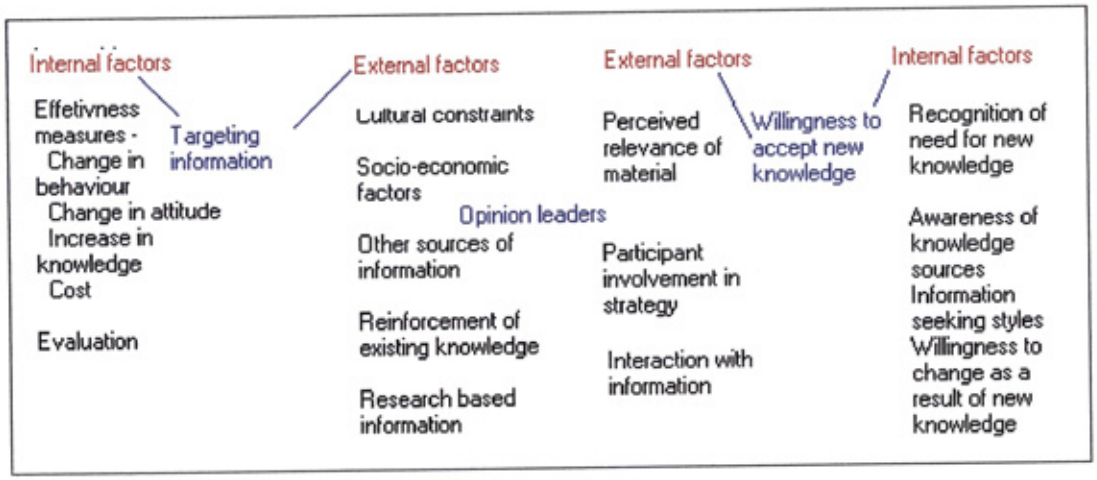
The underlying theories, however, not only provide the links between the internal and external factors but also between the roles of information provider and information recipient. Three concepts from the theories have a direct or indirect relationship with all of the other factors. These concepts are:

1) The willingness of the recipient to accept new knowledge
2) Targeting the information for a specific audience
3) The role of opinion leaders

The diagram overleaf (Figure 7) shows how these three concepts link the factors together. Thus, on the part of the information recipient their involvement in the dissemination strategy, level of interaction with the information provided and perceived relevance of the material is linked to their willingness to accept new knowledge, which in turn is dependant upon their information seeking style, recognition of the need for new knowledge, awareness of knowledge sources and willingness to change as a result of new knowledge. For the information provider their measures of effectiveness and difficulties with evaluation is linked to how specifically the information is targeted, which in turn requires consideration of cultural constraints, socio-economic factors, other sources of information, the use of research based information and the existing knowledge of the audience. The role of opinion leaders in the dissemination process is the linking factor between the information provider and the information recipient. A negative reaction, for example, by early adopters / opinion leaders will have an adverse effect upon the perceived relevance of the material by the remaining information recipients. By the same token, a positive reaction by opinion leaders can be instrumental in overcoming cultural constraints or socio-economic barriers. It has been noted, that modelled benefits "carry substantially

more force than exhortations in overcoming resistance to innovation" (Bandura, 1986).

Dissemination – Factors and Themes



(Figure 7)

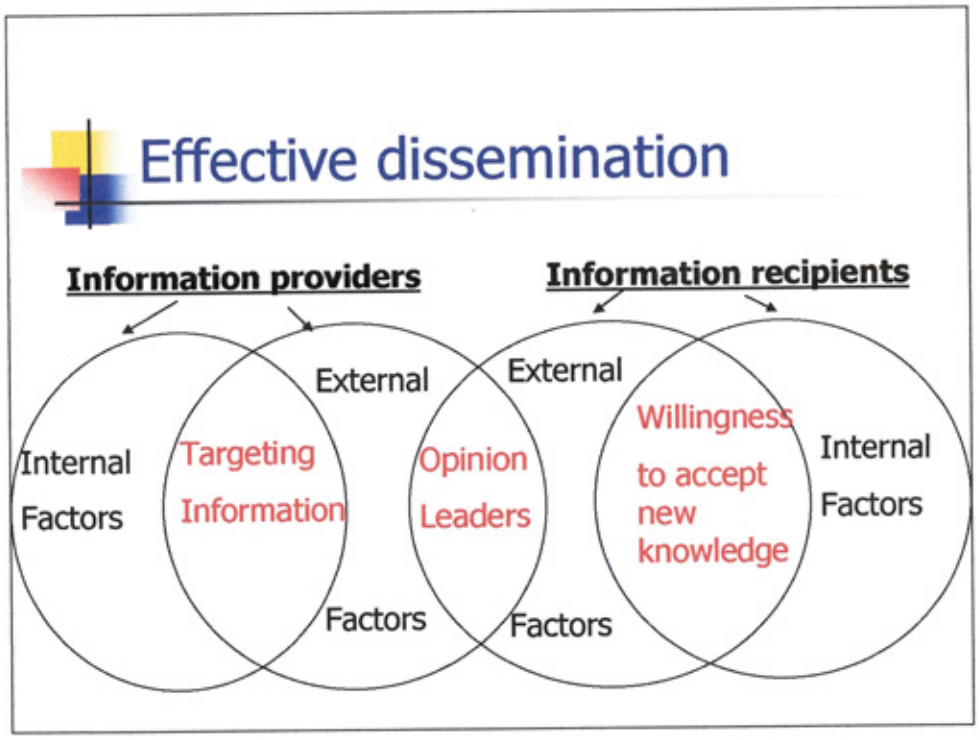
All of the factors must be considered as elements of an integrated whole rather than each factor in isolation. For the information provider, therefore, the dissemination method should be matched to the target audience, opinion leaders should be identified and utilised as a resource in the strategy, and optimum conditions for acceptance of the new knowledge can be created by involving participants in the process. Similarly, for the information recipient the perceived relevance of the material can be influenced by the opinion leaders, information targeted at them should reflect their cultural and socio-economic backgrounds and interaction with the information will positively affect their willingness to change behaviours or attitudes. One of the studies in the review illustrates these links.

The study was an evaluation of communication strategies employed by management during the incorporation of a college of health care studies as a new faculty of a university (Whitaker et al.1994). The management employed six different methods of dissemination ranging from a regular newsletter to large scale staff meetings with workshops (*matching method to audience*), one to one meetings with senior managers were available (*opinion leaders*) and an Incorporation Advisory Group, comprised of staff from all areas at all levels, collected information on issues that worried staff and

communicated to staff management's response (*involving participants in the process*). The main area of concern for the staff in this situation related to their posts in the new structure. The newsletter and the Advisory Group were rated the most useful communication methods by the staff. The newsletter contained personnel information as posts were filled in addition to details of the progress of the incorporation (*reflecting the cultural and economic background*). The advisory group was set up to channel staff concerns to the decision making groups; communication between the two groups was rapid and perceived as helpful (*interaction with the information*). Finally, although staff rated the opportunity of one to one meetings as beneficial, these were not greatly utilised. The researchers concluded that the offer of the senior managers time could be perceived as evidence that the management is prepared to take the trouble to listen to the concerns of the staff (*influence of opinion leaders*). This example illustrates how consideration of the elements highlighted by the synthesis can result in effective dissemination.

4.11 Conclusion

This review sought to determine the effectiveness of particular information dissemination strategies. The difficulties experienced in synthesising the research results illustrate the need for a shift in perspective, from a purely meta-analytic approach, when analysing qualitative research studies. The meta-ethnographic model of synthesis used in this review demonstrates that it is feasible to combine and compare qualitative studies. Evaluation studies, however, take this approach one stage further by determining a pattern from the key concepts highlighted by the meta-ethnographic synthesis. Identifying this pattern highlights, for the evaluator, the lessons that can be learned from the studies. In this instance, the review finds that the combination of the key factors is the key to effective dissemination, rather than consideration of any one particular factor in isolation. A model of effective information dissemination has, thus, been constructed (See Figure 8).



(Figure 8)

Identifying and combining the factors does, however, have significant implications for information providers. As the example above shows, information providers may need to utilise a number of dissemination techniques in their information provision strategy. Similarly, identifying the target audience and the environment within which the dissemination takes place, requires a considerable investment of resources, particularly before dissemination occurs. The identification of opinion leaders is potentially one of the most difficult aspects of the dissemination process for the information provider. As previously stated a negative reaction by opinion leaders can have a detrimental effect upon the information provision, moreover, the identification of opinion leaders within a specific environment is not itself without difficulty, as opinion leaders within a social system may not hold officially recognised positions. Despite these reservations, the example above shows that it is possible to incorporate the key factors in a dissemination strategy.

These findings will now be utilised as a framework for the evaluation of the dissemination process in Ponteland. The key factors highlighted by the review will inform the coding and categorisation of the data from the key informant interviews. The community questionnaires, which form the final element of data collection in the project, will also focus upon these key factors in the specific incidence of information

dissemination in Ponteland. It is anticipated that using the key factors in this way will ensure that the evaluation of the Ponteland incident encompasses all the requisite aspects of effective dissemination.

5.1 Introduction

The second objective of this research project was to determine the specific criteria set for the dissemination of information during the suspected TB incident. The data collection method used to gather data about this aspect of the dissemination process was key informant interviews. Interviews were chosen for this stage of the fieldwork to enable emergent issues to be developed and explored with a variety of informants. In addition documents produced during the incident are used to corroborate and substantiate the interview data. Gilchrist (1992) suggests, that researchers view key informants as "individuals who are able to teach the researcher." The qualitative systematic review of the research literature produced a model of effective information dissemination (See Figure 8), this next stage of the project, therefore, also sought to explore the elements of this model in the context of information dissemination during the suspected TB incident.

This chapter explains how the key informants were selected, the structure of the interviews and the approach adopted for analysis of the data. The results of the data analysis are then discussed in relation to both the proposed model and the original research objective.

5.2 Key informants

5.2.1 Sampling strategy

A 'snowball' sampling strategy was employed for the key informant interview phase of the research fieldwork. Sampling strategies employed in qualitative research are not driven by a need for 'representativeness', but rather by a quest for 'information rich' data. In qualitative research, "sampling is driven by the desire to illuminate the questions under study and to increase the scope or range of data exposed" (Kuzel, 1992). The selection of study participants is therefore purposeful rather than random. Each participant is selected on the basis of what they can contribute to the research, rather than upon their attributes as representatives of a wider population group. Patton (1990) identifies sixteen different purposeful sampling strategies available to the qualitative researcher:

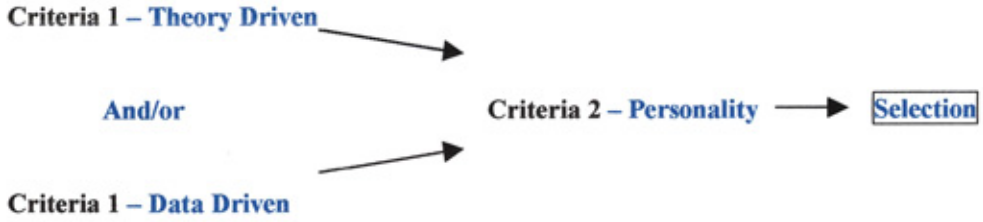
1. Extreme or deviant case sampling
2. Intensity sampling
3. Maximum variation sampling
4. Homogenous sampling
5. Typical case sampling
6. Stratified purposeful sampling
7. Critical case sampling
8. Snowball or chain sampling
9. Criterion sampling
10. Theory-based sampling
11. Confirming and disconfirming cases
12. Opportunistic sampling
13. Random purposeful sampling
14. Sampling politically important cases
15. Convenience sampling
16. Combination or mixed purposeful sampling

Patton (1990) describes snowball sampling as "identifying cases of interest from people who know people who know people who know what cases are information rich." Other sampling strategies that might have been employed in this project were homogenous sampling whereby a particular group e.g. a specific school year, are studied in depth, critical case sampling whereby critical cases e.g. non-English speaking members of the community are studied on the basis that if the dissemination was to be effective overall this group would have to consider the dissemination effective, or even convenience sampling whereby respondents are selected upon the basis that they are easily accessible and inexpensive to study e.g. friends and neighbours. Snowball sampling, however, is an "approach for locating information-rich key informants" (Patton, 1990). The strategy involves the initial identification of a few potential 'information-rich' informants, who are then asked to identify other potentially informative respondents. The number of informants participating in the study thus 'snowballs' as the study progresses. At some stage in the process the number of new potential informants will stop expanding, as the same names will be suggested again and again. 'Saturation' point will have been reached and no further

interviews will be scheduled. Kuzel (1992) contend that this "sampling to the point of redundancy yields a more convincing explanation of events." Maykut and Morehouse (1994) also suggest that researchers employing a snowball sampling strategy "locate subsequent participants that are very different from the first to encompass maximum variation within the sampling process."

5.2.2 The informants

The primary criteria for selection of the key informants, was that they should be able to provide information about particular elements of the information dissemination process during the suspected TB incident. Gilchrist, (1992) used this approach to seek information about the early days of a medical centre, which only specific individuals were able to relate. A small number of individuals, identified at the outset, were able to introduce other individuals with the requisite knowledge who were previously unknown to Gilchrist. As well as having knowledge of the event being studied however, potential key informants must also be prepared to share their knowledge with the researcher. Using Johnson's model of key informant selection, (See Figure 9) an initial list of eleven potential respondents were identified.



(Figure 9 taken from Gilchrist, 1992)

The individuals were identified at the outset of the research and their selection was, therefore, theory rather than data driven. The eleven individuals represented three distinct elements of information provision during the suspected TB incident, namely:

1. Health professionals involved in information provision during the incident
2. Education officials involved in information provision during the incident
3. Other information providers involved during the incident

A letter requesting an interview was sent to each of the eleven individuals (See Appendix 7).

5.2.3 Gaining Access

As Hughes (1996) points out "respondents form impressions about you when first introduced to your research." Morse (1998) moreover, is also of the opinion that "the most difficult part of a project is knocking on the first door to solicit the first participant." The letters sent to prospective interviewees, therefore, established that the requested interview was part of a PhD study investigating the dissemination of information during the suspected TB incident. The letters were addressed personally to each potential respondent. To ensure the letters were properly addressed names and addresses were clarified by telephone prior to despatch. A systematic review of strategies adopted to increase response rates to postal questionnaires concluded that making letters more personal increased response rates (Edwards et al. 2002). The letters also explained why the individual was being asked to participate in the research. In addition, as each individual was asked to participate in their professional capacity, the letter specified the expected duration of the interview and indicated the researcher's willingness to conduct the interview at a convenient location for the interviewee. Acknowledging, in this way, the many existing demands upon the prospective interviewees time, would, it was anticipated, increase the possibility of a positive response from the individuals.

A variety of response mechanisms, including the enclosure of a pre-paid, self-addressed envelope, with the interview request, were given in a further attempt to encourage a positive response. Edwards et al.'s (2002) systematic review of strategies designed to increase response rates to postal questionnaires concluded that including stamped addressed envelopes and sending requests by first class post would both lead to increased response rates. The letter also requested the respondent to advise the researcher if they did not consider themselves to be an appropriate interviewee for the study, and if so could they nominate a suitable respondent. Thus, the snowball

sampling strategy also operated through the medium of the interview request letter as well as the personal request during the interviews.

In addition, a research consent form was also included with the interview request letter (See Appendix 8). This consent form was adapted from a generic consent request form employed previously by the Information Management Research Institute, (IMRI).

Informed consent is one of the ten standards set for medical research in the Declaration of Helsinki (BMJ, 1996). This Declaration lays the onus firmly upon the researcher to ensure that potential participants understand fully the nature of the research in which they are being asked to participate. Barnes et al. (2000) for example, requesting interviews with mothers with breast cancer, explicitly stated in the consent request form "participation would not influence their ongoing medical care." The issue of informed consent is the subject of much debate in the medical research field (Smith 1997, Gattellari et al. 2002) where the question of how 'informed' participants in medical research can really be has yet to be resolved for researchers in the field. Whilst none of the potential respondents would be placed at any medical risk by taking part in the research, the basic principle of informed consent is still applicable to the research project.

Seidman (1998), writing for researchers in education and the social sciences, advises that consent forms should include the following:

1. The identity of the researcher and who to contact if they have any problems with the research process
2. Any risks faced by the participants as a result of participating in the research, and any steps taken by the researcher to minimise these risks
3. A statement to the effect that participation in the research is entirely voluntary
4. The rights of participants in the research process
5. Whether or not participants names will be used in the study
6. How the results of the study will be disseminated
7. Any special conditions for children

Ackroyd and Hughes (1992) moreover, state "interviewers must quickly establish their credentials." In this project, therefore, the consent form identified the researcher as a PhD research student at the University of Northumbria at Newcastle. Potential

participants were advised to contact the Head of the School of Information Studies at UNN, at the address given if they had any problems with the research process thus establishing the academic credentials of the research project. The consent form stated that the project did not incorporate any procedures or requirements that may be found to be ethically objectionable. Respondents, however, were advised of their right to report any objections, either now or in the future, to the Head of the School of Information Studies. In addition respondents were given assurances that interview data would be used anonymously in the final thesis submitted, and in any journal articles or conference papers published as a result of the project. The consent form also advised potential respondents that their participation was entirely voluntary and required no contribution other than the requested interview. At this stage of the research project, children were not involved in the fieldwork, therefore no special conditions were required to ensure their informed consent.

A follow-up letter, similar to the initial letter (See Appendix 9), was sent two weeks after the first request if no response had been received. Again this has been shown to increase response rates (Edwards et al. 2002).

Of the initial eleven interview requests made, one negative response was received from an education official who was not in the post during the suspected TB incident. No response was received from one other education official to either the initial request, or the follow up letter. One potential respondent also replied by providing contact details of a more appropriate informant for the purposes of the research. Nine interviews were therefore arranged for the initial phase of this fieldwork. Each of the three categories of information provider during the suspected TB incident were represented in the initial interviews; three interviews were arranged with education officials, four with health officials and two with other information providers.

5.3 The interviews

5.3.1 Interview structure

Interviews take many forms ranging from a quick five-minute telephone interview through to an in-depth cycle of interviews or, indeed, group interviews. As well as the length of time taken and the number of individuals participating, the actual format of the interview itself can vary. Interviews can range from very structured, virtual

questionnaires requiring simple, short answers to completely unstructured, conversational dialogues between the interviewer and the interviewee. In the first case, the aim is to ask the same questions in the same order of a number of respondents. At the opposite end of the continuum, the unstructured interview is driven by the interviewee with only occasional steering of the subject discussion from the interviewer.

One criticism of the very structured interview is that "unless all respondents share a single interpretation of a question their answers cannot be compared" (Ackroyd & Hughes, 1992). As such, this type of interview reflects its similarity to self-administered questionnaires, and as with questionnaires the format does have the advantage of being relatively easy to administer, particularly if the interviews are to be conducted by a team of interviewers. Unstructured interviews, on the other hand, may be very time consuming to administer but have the advantage of allowing the interviewer to explore the interviewee's interpretation of the questions. Ackroyd and Hughes (1992) suggest that unstructured interviews are "useful in pilot studies and for exploring a topic to help define the salient issues for the researcher, whilst structured interviews are useful for testing hypotheses."

Between these two extremes lies the semi-structured interview which "combines, or attempts to do so, the advantages of both the very structured and completely unstructured interview types" (Ackroyd & Hughes, 1992). Patton (1990) describes this middle-of-the-range interview type as following an "interview guide approach." The interview guide provides topics or subject areas, within which the interviewer is "free to explore, probe and ask questions that will elucidate and illuminate that particular subject" (Patton, 1990). Thus, whilst the interviews will cover broadly the same areas, the interviewer is free to develop specific areas of interest with each interviewer. Maykut and Morehouse (1994) differentiate between an interview guide, a series of topics or broad interview questions, and an interview schedule, a detailed set of questions and probes. The interview guide format was adopted for the interviews conducted during this research project. As the interviews will be conducted with individuals from health, education and other information provision backgrounds, they will not only attempt to cover the broad area of information dissemination during the suspected TB incident, but also the particular aspects of the incident and dissemination of information relating to the informant's area of expertise. Gorman and Clayton (1997) consider encouraging the interviewee "by the use of open-ended

questions or by non-directive listening, to highlight self-perceived issues of relationships of importance" as a distinct advantage of interviewing as it is employed in qualitative research. They moreover contend that this aspect of an interview "can be of inestimable value in understanding contexts and creating links."
The interview guide in this research project (See Appendix 10) relates to the broad area of information dissemination, thereby allowing the interviewer the flexibility to develop the particular aspects independently. Maykut and Morehouse (1994) suggest following the steps outlined below when developing an interview guide:

1. Write out focus of inquiry
2. Brainstorm questions that relate to the inquiry
3. Identify potential categories of inquiry
4. Decide which categories to include in the interview
5. Develop broad open-ended questions
6. Arrange questions in a useful sequence
7. Draft interview guide
8. Practice interview
9. Revise interview guide
10. Commence interviews

This approach to producing an interview guide is particularly useful when interviews will be conducted by a team of interviewers, but is also beneficial for the novice researcher. As Lincoln and Guba (1985) point out "by maintaining a record of interview development researchers begin an audit of their work, which contributes to the trustworthiness of research outcomes."

5.3.2 Pilot interviews

Janesick (1998) suggests "preinterviews with selected key participants can assist the researcher in a number of ways." Blaxter, Hughes and Tight (1996) advise researchers that the value of pilot research cannot be overestimated." Whilst Seidman (1998) asserts, that "the best piece of advice [he] ever received as a researcher was to do a pilot of [his] proposed study."

One of the main values of pilot research for novice researchers is in highlighting potential problems or difficulties with the research method, whilst there is still an opportunity to counteract them. Pilot interviews, for example, can alert a researcher to any interview techniques that perhaps require modification before the full interviews are undertaken. In addition, for novice researchers, pilot interviews allow for practice with the practical aspects of arranging, recording and transcribing interviews. Seidman (1998) also contends that pilot interviews can bring to the researchers attention "the elements of their own interview techniques that support the objectives of the study and those that detract from those objectives."

Two pilot interviews were conducted in this research project. The two individuals were known to the researcher in a personal capacity, but were also marginally involved in the incident. One pilot interviewee was an education official in the community during the incident, whilst the second individual was a health official, also in the community and, involved in the incident as a parent rather than in their professional capacity.

Both interviews were recorded, with the permission of the interviewees, and the tapes were transcribed by the researcher. The interviews were particularly beneficial in furnishing the researcher with contextual detail in relation to education and health management issues relating to the incident. These insights provided direction for the interview guide employed in the subsequent interviews with both health and education officials.

The pilot interviews also highlighted potential difficulties with the recording equipment, relating to the siting of the equipment and the quality of the resultant recording. This realisation undoubtedly averted the occurrence of similar problems in the full interviews with a subsequent loss of relevant data.

The two pilot interviews were thus extremely worthwhile both for the researcher and the research project.

5.3.3 Sampling strategy in practice

The initial selection of informants for the interview phase of the fieldwork was theory-driven (See Figure 9). However, upon the commencement of the interviews subsequent informants were data, rather than theory, driven. Identification of potential informants, after the initial interviews, was made by one of two means. Individuals

that were stated to be involved in the dissemination process during an interview were contacted with a request for an interview. In addition, each interviewee was asked at the end of the interview to nominate any particular individual, who might be able to contribute to the research. Using this strategy a further twelve interview requests were made. The twelve potential interviewees again represented the three distinct elements of the information provision:

1. Health professionals
2. Education officials
3. Other information providers

With the identification of four education officials and one health official the majority of the potential interviewees belonged to the third category. Four potential informants were involved in the media coverage of the incident, whilst the remaining three potential informants were involved in the local authority information provision relating to the incident. Interview requests to the twelve potential informants followed the same procedure as the initial interview requests. Potential informants who had been nominated by an interviewee were advised of this in the initial interview request letter. Again follow-up request letters were sent out within 2 – 3 weeks of the initial request if no response was received from the initial request.

Two of the potential informants advised that they had not been involved in the suspected TB incident, and were therefore inappropriate as informants, one potential informant declined the interview request, whilst three potential informants did not respond to either the initial interview request or the follow-up request. One potential informant passed the interview request on to another individual who agreed to participate with the research. Six interviews were therefore conducted, one with a health official, two with education officials and the remaining three with other information providers. Again these individuals were asked to nominate other potential informants but no new informants were identified.

At this stage, individuals suggested as potential informants had either already been contacted and interviewed, or had been contacted and declined to be interviewed. It was, therefore, deemed that 'saturation point' had been reached.

Fifteen interviews in total were granted. The informants represented all aspects of the information provision during the incident, five education officials, five health officials

and five other information providers. The informants represented various areas of expertise e.g. public health management, children's health care, children's educational provision, community information provision, environmental health management, the media and leisure services management. Furthermore, no areas of information provision identified by the informants were omitted from the study as a result of potential informants declining to be interviewed. It was, therefore, considered that as Maykut and Morehouse (1994) suggest " maximum variation within the sampling process" was achieved.

The interviews varied in length from 20 minutes to over 2 hours. All but the two shortest interviews were recorded. The two interviews not recorded were written up as field notes immediately after the interviews finished. Field notes were also taken both during and after the recorded interviews.

5.3.4 Data preparation

Prior to commencing data analysis the fieldwork data must be organised into a suitable format for the analysis. In the case of recorded interviews this generally involves transcription of the interviews, or at the very least the generation of a summary and index of the tapes contents (Boulton & Hammersley, 1996). Seidman (1998) however contends that reducing the interview data at this stage in the process is "one step too early in the winnowing process."

The conventions employed in the transcription process depend, to an extent, upon the approach that will be taken by the researcher to the subsequent analysis. Transcriptions for discourse analysts, for example, will include the "times of pauses, clearly marked overlaps in talk between one speaker and another, as well as other verbal and non-verbal features of the talk" (Boulton & Hammersley, 1996). The transcription and subsequent analysis of the interview data recorded for this project did not, however, require such detailed transcription. The interviews in this research were typed verbatim. Furthermore, the interviews were transcribed by the researcher, which Maykut and Morehouse (1994) note "provides an important opportunity to relive the interview and become substantially more familiar with the data."

Annotations were included in the typed transcripts where documents such as newsletters and press cuttings were referred to in the interview. The complete set of data available for analysis ultimately consisted of:

1. Thirteen interview transcripts and related field notes
2. Written field notes from the two interviews that were not recorded
3. Copies of all the newsletters distributed during the incident
4. Press cuttings relating to the incident
5. Other documents produced by local government officers relating to the incident
6. The transcript of a television report concerning the incident

5.4 Data analysis

5.4.1 Approach

Miles and Huberman (1998) define data analysis as "three linked sub-processes: data reduction, data display and conclusion/verification". These activities are not performed sequentially, but rather are part of an iterative process of analysis. Miles and Huberman (1994) moreover, assert that researchers employing qualitative research methods need to "log and describe our procedures clearly enough so that others can understand them, reconstruct them and subject them to scrutiny."
The approach to data analysis employed in this project was the 'Framework' approach, originally developed for data analysis in the field of applied policy research (Ritchie & Spencer, 1994). Due to the nature of applied policy research the approach had to be flexible enough to adapt to circumstances such as short time scales, projects employing teams of researchers and explicit decision-making processes. 'Framework' has certain key features that its developers consider facilitate this flexibility in the approach (Ritchie & Spencer, 1994):

1. It is heavily based in, and driven by, the original accounts and observations of the people it is about
2. It is open to change, addition and amendment throughout the analytic process
3. It allows methodical treatment of all similar units of analysis
4. It allows a full review of the material selected
5. It allows access to, and retrieval of, the original textual material

6. It enables comparisons between, and associations within, cases to be made
7. The analytic process, and the interpretations derived from it, can be viewed and judged by people other than the primary analyst.

The approach involves a systematic process of sifting, charting and sorting material according to key issues and themes (Ritchie & Spencer, 1994). Although the process is systematic there is recognition of the intuitiveness of qualitative analysis. The process incorporates five stages, which although distinct within themselves are nevertheless interconnected and able to be repeated and returned to throughout the analysis. The stages are:

1. Familiarization
2. Identifying a thematic framework
3. Indexing
4. Charting
5. Mapping and interpretation.

5.4.2 Developing the framework

As the name suggests familiarization involves reading all of the documents produced for analysis to gain an overview of the material. The transcription of interview recordings is an element of the familiarization process. During familiarization the researcher looks to identify recurrent themes and key ideas from the informants own words. The identification of a thematic framework then follows naturally from the familiarization process.

There are two key elements to the thematic framework, namely, the issues generated by the research aims and the issues raised by the informants. In this research project a third element of the thematic framework was drawn from the previous phase of the project, the qualitative systematic review of the research literature. The framework for the data analysis was, therefore, developed from:

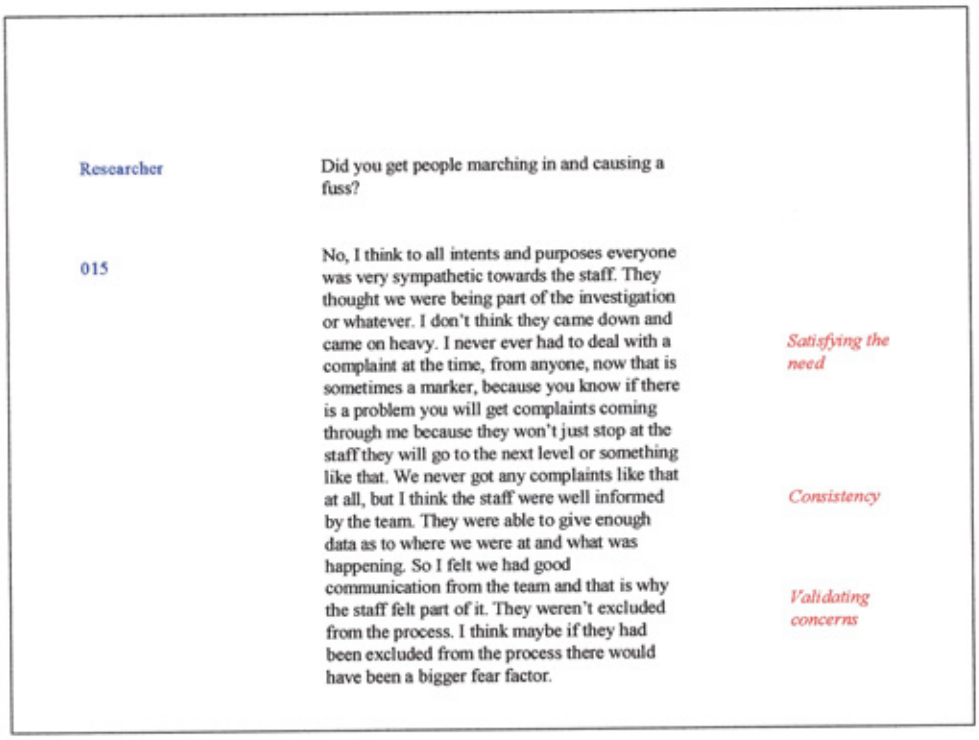
1. The criteria set for the information dissemination process *(one of the original research aims)*

2. The elements of effective information dissemination *(the theme arising from the previous phase of the research)*
3. Issues and themes raised by the informants during the course of the interviews.

Ritchie and Spencer (1994) note that the first version of a framework "is often largely descriptive and heavily rooted in a priori issues." They also comment that when this initial version has been applied to a few transcripts the categories within the framework will be refined, and "become more responsive to emergent and analytical themes."

Applying the framework to the research documents is the indexing stage of the process. Documents are read and annotated where instances of text occur that are judged to be relevant to particular categories within the thematic framework. Ritchie and Spencer (1994) note that applying the framework "is not a routine exercise as it involves making numerous judgements as to the meaning and significance of the data." For large amounts of data this is easiest to manage with a numerical system linking the data and themes. In this project, however, a descriptive system linking the text with the themes was sufficient for the amount of data collected.

Annotating the text with the sub-headings serves a dual purpose. Connections and associations within the data become visible when passages of text have more than one heading attached to them. In addition others can see for themselves how the data are being "sifted and organised" (Ritchie & Spencer, 1994). Figure 10 shows a section of annotated text taken from an interview with an education official.



Researcher	Did you get people marching in and causing a fuss?	
015	No, I think to all intents and purposes everyone was very sympathetic towards the staff. They thought we were being part of the investigation or whatever. I don't think they came down and came on heavy. I never ever had to deal with a complaint at the time, from anyone, now that is sometimes a marker, because you know if there is a problem you will get complaints coming through me because they won't just stop at the staff they will go to the next level or something like that. We never got any complaints like that at all, but I think the staff were well informed by the team. They were able to give enough data as to where we were at and what was happening. So I felt we had good communication from the team and that is why the staff felt part of it. They weren't excluded from the process. I think maybe if they had been excluded from the process there would have been a bigger fear factor.	*Satisfying the need* *Consistency* *Validating concerns*

(Figure 10)

5.4.3 Constructing a thematic picture

Once the framework has been applied to the data, the next stage of the process is to construct a thematic picture from all of the data. This is achieved by charting the themes. Data are "lifted from their original context and rearranged according to the appropriate thematic reference" (Ritchie & Spencer, 1994). The charts may either draw together references to a theme across all the cases, or alternatively draw together references in a case across all the themes. In this project, the charts drew together references to a theme across all the cases. Although the emphasis was upon the treatment of the themes across the cases the "cases are always kept in the same order for each subject chart, so that the whole data set for each case can easily be reviewed" (Ritchie & Spencer, 1994).

Mapping and interpretation involves looking for associations, patterns and explanations. Dey (1993) likens this phase of qualitative data analysis to the completion of a jigsaw puzzle, where "different facets of social action and their mutual connections" can be identified in the finished puzzle. Ritchie and Spencer

(1994) advise that piecing together the overall picture is "not simply a question of aggregating patterns, but of weighing up the salience and dynamics of issues, and searching for a structure rather than a multiplicity of evidence."
Miles and Huberman (1994) suggest 13 specific tactics that researchers might employ to facilitate interpretation of the data:

1. Noting patterns and themes
2. Seeing plausibility
3. Clustering
4. Making metaphors
5. Counting
6. Making contrasts/comparisons
7. Partitioning variables
8. Subsuming particulars into the general
9. Factoring
10. Noting relationships between variables
11. Finding intervening variables
12. Building a logical chain of evidence
13. Making conceptual /theoretical coherence

Although these tactics are portrayed above as discrete actions, in reality researchers employ a range of tactics in their analyses of qualitative data. In this particular study patterns and themes were noted, data was clustered under sub-headings and conceptual and theoretical coherence was sought.

5.5 Findings

5.5.1 Criteria

5.5.1.1 Health professionals

Analysis of the interview data involved taking a number of pathways through the data, where each pathway involves systematically gathering data on a particular topic on each reading of the data. The first of these pathways looked for data relating to the

dissemination criteria set by the various information providers. Data collected from this reading of the text were collated under seven different headings. The headings, which were in some cases taken from the informants' own words, were:

1. Carry on as normal
2. Don't create a panic
3. Parents before press
4. Consistency
5. Communicating uncertainty
6. Satisfying the need
7. Validating concerns
8. Adhering to the programme

Figure 11 shows a section of the chart constructed for this theme containing the data from four interviews.

Satisfying the need	Validating concerns	Adhering to the programme
We just stopped photocopying the letters (p4)		
I want a decision now (p4) I was satisfying the need for information (p8) If you are getting 95% success rate you are doing pretty damn good. (p9) Never had a single antagonistic phone call (p9)	We have to go and talk to people (p3) If people had problems ring us up (p9) Those directly affected and the 'worried well' (p9) Majority probably rang GP (p10)	95% of the children continued the medication for 6 months (p10)

Satisfying the need	Validating concerns	Adhering to the programme
	Parents rang me up (p3) It was just the odd parent that rang up (p5)	
Priority was risk communication, but there were wider communication issues to be considered (p1)	Meetings were to talk to the parents and answer questions (p1)	
	Wasn't aware of a demand [for information] (p1)	

(Figure 11)

When all of the data was charted under the seven headings it was apparent that some of the headings only applied to certain information providers. Patton (1990) advises researchers to search for negative cases and alternative explanations to strengthen the credibility of the research findings. Re-reading the data highlighted that the issues of adhering to the programme and communicating uncertainty were only raised by the health professionals involved in the incident. Both of these issues are directly related to the medical model of illness, discussed in Chapter 1 (See Section 1.5.1), with its emphasis upon the detection and treatment of illness and the scientific, rational explanation of disease. The initial focus of the health professionals was to "search for the source of the infection, treat children who tested positive with antibiotics in the expectation that they will make a full recovery with no lasting ill effects" (TB update, 26/01/98). Encouraging adherence to this programme of medication was, therefore, a vital aspect of the health professionals' role in the incident. Moreover, as the situation developed and a rational explanation of the test results was not forthcoming, it became the health professionals' role to explain why "it was quite possible that we

will never get a conclusive scientific 'answer' to all of the questions that surround this incident" (TB update 03/06/98).

5.5.1.2 Stopping panic

Of the remaining five headings, three were related to one issue – stopping panic. These three headings were:

1. Carry on as normal
2. Don't create a panic
3. Parents before press

This common theme of 'stopping panic' was the first of the criteria identified that was set for the dissemination process by the information providers. The three sub-headings referred to different aspects of the criteria 'stopping panic'. Each heading represented a strategy adopted by the information providers to ensure that there was no sense of panic in the community.

Carrying on as normal can be linked to social cognitive theory, which highlights the importance of modelling behaviour as a method whereby individuals learn from one another. In social modelling "the observer extracts the essential elements from an observed behaviour pattern in order to perform a similar behaviour" (Rogers, 1995). Education officials experience modelled behaviour in the children they teach as "peers are especially influential" for children (Rice & Atkin, 1994). Information providers adopting the attitude that the incident was "something you could take in your stride" (Interview 001), were displaying to the community their calm response to the situation. This modelling aspect of social cognitive theory is one of the theoretical underpinnings of the qualitative systematic review synthesis and analysis discussed in Chapter 4. In the review findings the theory provided the linking factor between the information provider and the information recipient (See 4.10.4), where it was noted that "modelled benefits carry substantially more force than exhortations in overcoming resistance to innovation" (Bandura, 1986). In the suspected TB incident, therefore, it is suggested that 'carrying on as normal' would be more effective in stopping any possible panic in the community, than would simply relying upon statements in the newsletters such as "no child will come to harm due to the time

taken during this process" (TB update 06/01/98) or "none of the children can transmit this infection to anyone else, whether adult or child" (TB update 26/01/98).
Behaviour designed to ensure that panic was not created was another aspect of this theme. Not creating a panic reinforces the modelled behaviour of carrying on as normal. The information providers here acknowledged that the situation was unusual, "sending a letter is an abnormal event" (Interview 002) and that specific behaviour might have a detrimental effect upon the situation " one or two jump on the bandwagon" (Interview 008). Thus, a number of positive actions were taken to prevent or forestall the possible creation of panic in the community. These actions included speaking to the pupils "trying to allay their fears" (Interview 014) and "going to great lengths to be approachable" (Interview 015).
Social cognitive theory also suggests that a negative reaction by opinion leaders will have an adverse effect upon the adoption of an innovation by other members of a social network (Bandura, 1986). Information providers in the suspected TB incident, therefore, talked about:

"using information that was not alarmist" (Interview 011)
"positively putting out statements" (Interview 007)
sending out letters "to create the impression that it was alright to come down here" (Interview 014).
"keeping a lid on it" (Interview 008)

Press reports at the time of the incident included the message that "excellent work by the medical team picked up the TB cases so early" (Elliott, 1997) and also that "parents had been very calm" (Welford, 1998).
Despite these messages reflecting the criteria to stop panic being created the main strategy adopted by information providers, other than the media, was to ensure that parents received information before it appeared in the press and media. Risk communication research asserts that experts blame the media "for what they see as a public over-reaction to risk" (Slovic, 1986). A high level of media attention is also one of the factors associated with increased public concern (Hendee, 1995). Other factors that can lead to high levels of concern also include involuntary exposure,

children being specifically at risk and scientific uncertainty, all applicable to this incident.

With regard to health information, however, individuals consider the media as the second key source of information after their GP (See Section 1.5.2). The media, therefore, play an important role in the interpretation of risk information for the general public. Moreover, "dramatic events which receive extensive media coverage are likely to seem more 'risky' to media consumers, while common everyday hazards are underestimated" (Short, 1984). Thus when the headline "TB on the rampage again" (Bosely, 1998) appeared during the incident referring to an unrelated incidence of the disease, it would have reinforced the communities' perception that the suspected TB incident was indeed a high-risk situation. In addition, headlines such as "Huge hunt as killer bug sweeps school" (Oldfield, 1997), designed to portray the incident as a dramatic event, are inevitably more memorable than reports extolling the excellent work by the medical team. The 'killer bug' article variously described TB as:

- A killer lung disease
- A deadly disease
- The scourge of Britain
- A crippling lung disease *whose*
- Countless victims died slowly and painfully, tortured by hacking coughs

This article illustrates Covello's (1989) criticism of the media for "selective and biased reporting that tends to emphasise drama, conflict, expert disagreements and uncertainties." The 'killer bug' article was published at a very early stage of the incident and might, therefore, account for the desire to ensure that parents received the experts' opinions and interpretations of risk before the same information was relayed to the press and re-interpreted.

However, as the media "are a prime transmitter of information on risks" (Covello, 1989) it is perhaps likely that individuals incorporated both the information they received directly and the media coverage into their assessment of the situation. The community's perception of the media coverage of the incident is explored further in the questionnaire survey conducted in the next phase of the fieldwork.

5.5.1.3 Consistency

Two further themes were identified from the remaining sub-headings:

1. Maintaining consistency
2. Validating concerns

Buckland (1995) lists four main types of consumer health information sources:

1. Information provided as part of the process of medical treatment
2. Information services or helplines
3. Self-help information sources e.g. books or leaflets
4. Informal sources of information

All of these types of information source were available to the community during the incident. Maintaining the consistency of the information across all the information sources was the second criterion explicitly set for the dissemination process. A number of actions were taken to ensure that information provision was consistent as the following quotes illustrate.

> "I was given a very clear brief about what I ought to say" (Interview 014)
>
> "We put a lot of time and effort into making sure all the staff in the schools were briefed" (Interview, 009)
>
> "One person calling the shots otherwise it would lead to total confusion" (Interview 008)
>
> "They explained how it all works, the medical side of it in layman's terms" (Interview, 015).

The dissemination process during the suspected TB incident followed a classical centralized diffusion system. This system design was originally modelled in the Ryan and Gross hybrid corn study mentioned in Chapter 2 (See Section 2.2.3.1). In this diffusion model "information originates from some expert source and is diffused as a uniform package" (Freimuth, 1987). Adoption of a centralized diffusion system "based on a linear one-way model of communication" (Freimuth, 1987) encourages uniformity and discourages local adaptation. During the suspected TB incident information providers were encouraged to refer enquiries to a centralised information source.

> "we were told to refer any queries" (Interview 012)
>
> "they were in charge of it all" (Interview 004)
>
> "whilst it is held in a close forum it is easier to control" (Interview 015)
>
> "it was well handled from a central source" (Interview 008).

Rogers (1995) contends that centralized diffusion systems are most appropriate when the information being diffused "involves a high level of technical expertise" as was the case during the suspected TB incident.

There was some evidence to suggest that despite efforts to maintain consistency, some information providers did re-interpret the information before dissemination, however, there was an overall intention to present information to the community in a consistent manner.

> "that is just me making it up" (Interview 001),
> "schools sent out what they wanted" (Interview 002)
> "one or two colleagues who weren't experts giving opinions" (Interview 013),

5.5.1.4 Validating concerns

The third criterion explicitly set for the dissemination process was to "validate the concerns" of the community. The criterion had two distinct aspects, one was acknowledging the community's concerns and the other was satisfying the need for information as a result of these concerns.
Information providers, particularly health professionals, were conscious of encouraging the community to have confidence and trust in the information dissemination process. Newsletters stated that their purpose was to:

- "Keep the community up-to-date with what is happening at the moment" *(TB updates 06/01/98, 20/01/98)*
- "Ensure that everyone has the fullest available information" *(TB update 26/01/98)*
- The community's "concerns and anxieties are well to the front of our minds" *(TB update 06/01/98)*
- "Though there is yet no satisfactory explanation of what has happened, we will continue to work vigorously to find one" *(TB update 11/02/98).*

This acknowledgement of concerns is not a component of epidemiological risk communication, which concentrates upon the purely technical and scientific aspects of risk analysis and communication. It is, however, an element of the sociological perspective on risk analysis and communication, which encompasses the issues of confidence, trust and responsibility in the assessment of risk (See section 2.2.1). Covello (1989), for example, advises risk communicators to "let people know that you understand what they said, addressing their concerns as well as yours." Covello goes on to state that "trust and credibility are [a risk communicators] greatest asset." Informants recognised this issue and talked about "coming across as straightforward and honest" (Interview 013). The presentation of information was seen as "encouraging parents to have confidence in the information" (Interview 014) and the

result of a particular action was highlighted as being "one more thing to take off people's list of concerns" (Interview 015).

The other side of 'validating the community's concerns' identified from the framework was the issue of satisfying the need for information as a result of the concerns. Analysis of the data gathered under the heading 'satisfying the need' highlighted that the information providers deemed the information dissemination process effective because they considered that they did satisfy the need for information. The informants commented that "if no one turned up [to the meetings] it meant that they didn't have any issues to discuss" (Interview 013). Other comments in this vein were:

> "we didn't have any parent saying we are not satisfied" (Interview 011)
>
> "if they are not asking for more information they must have enough" (Interview 009)
>
> "we never had a single antagonistic phone call" (Interview 009)

From these comments it is apparent that information providers equated not seeking information with satisfaction with the information being provided. However, Mangan and Miller's (1983) research with information 'monitors' and information 'blunters' suggests that this is not the case, that whilst information 'monitors' actively seek more information about the situation they are faced with, information 'blunters' consciously avoid information about the situation. Information 'blunters' involved in the suspected TB incident would therefore be unlikely to attend the public meetings, or avail themselves of the services of the telephone help-line publicised in the newsletters and may not even have read the newsletters. Information 'monitors', on the other hand, were likely to attend public meetings, might use the telephone help-line to ask specific questions and undoubtedly read the newsletters when published. A high incidence of information 'blunters' in the community, would inevitably lead to low attendance figures for the public meetings and little use of the telephone help-line facility, whilst a high incidence of information 'monitors' would have an opposite

effect. Moreover, as van Zuuren and Wolfs (1991) research indicates individual's who displayed information monitoring behaviour at the start of the incident, could as a result of this behaviour have modified their information seeking activities, and adopted an information blunting strategy. Indeed one information provider was bemused to note that an individual had expressed the wish that the community was faced with an outbreak of TB infection, because at least then they knew what they were dealing with (Interview 002).
Realisation that this assumption had been made about the community led to a further reading of the data to ascertain whether there were other assumptions that the information providers held about their audience.

The first reading of the data thus identified the explicit criteria set for the dissemination process by the information providers:

1. To stop panic
2. To maintain consistency
3. To validate the community's concerns

Whether these criteria were met by the information providers will be explored in the questionnaire survey, the next phase of the research. However, before this occurs further analysis of the key informant interview data is required.

5.5.2 Assumptions

5.5.2.1 Negative cases

It was apparent that the criteria identified above were underpinned by at least one assumption about the audience; not seeking information was the same as being satisfied with the information already provided. The second reading of the data, therefore, looked for other assumptions that the information providers might have held about their audience. Data collected from this second reading of the text were collated under six separate sub-headings:

1. A well-educated community

2. Exceptions to the norm
3. Upholding the notion
4. Audience behaviour
5. Assumptions
6. Parents and communication

Again charting of this data revealed that two of the information providers had not expressed opinions relating to any of these aspects. These two information providers were neither the same type of provider, nor did they share the same geographical location. Patton (1990) recommends "considering instances and cases that do not fit the pattern" as a means of enhancing the quality and credibility of the qualitative data analysis. The six sub-headings were loosely collected under the title 'Perceptions of Ponteland'. One of the two information providers was not based in Ponteland and only became involved in the latter stages of the incident when the prospect of a large TB outbreak was already diminishing. Their perception of Ponteland as a 'host place' for TB was, therefore, not subject to the same intensity as was the case with the information providers who had been involved in the incident from the very beginning. In addition, this information provider was in a somewhat isolated geographical location and therefore was only involved with the incident in terms of its impact upon them and their isolated community, rather than upon the larger impact experienced in the more widespread community of Ponteland.
The second information provider, on the other hand, was involved from the outset, and was situated within the geographical boundaries of Ponteland, but staff changes since the incident restricted the availability of data from this particular source. It is thus possible that had the interview been conducted at an earlier stage in the incident the views provided might have included data relevant to this aspect of the research.

5.5.2.2 A middle class community

Three of the six sub-headings were related to one issue, Ponteland as a middle-class community. These three sub-headings were:

1. A well-educated community
2. Exceptions to the norm
3. Upholding the notion

This common theme of a well-educated, middle class community was therefore the second assumption identified by the data analysis. A number of informants described the community within which the suspected TB incident occurred in similar terms.

> "an extraordinarily scientific and literate audience" (Interview 002),
> "average parent, highly articulate, university educated, abstract thinking person" (Interview 013)
>
> " an educated audience" (Interview 009)
>
> "a lot of medical people live in the community" (Interview 012).

Exceptions to this assumption were explained as anomalies, such as "she was drunk" (Interview 002) when discussing the behaviour of one individual at a public meeting, "one or two that jump on the bandwagon" (Interview 008), and "one of the parents or one of the teachers must have over-reacted" (Interview 009) when describing individuals or situations where behaviour was not consistent with the norm. In addition informants were keen to justify their assessment of the community and the community's behaviour, "how she was coming across wasn't actually what was going on" (Interview 008), and "it wasn't living in Ponteland that was the issue" (Interview 002) and "we don't want the schools to be tarred by a brush" (Interview 009).
Assuming that they were dealing with a well-educated, middle class community underpinned the strategy to inform the parents before the press. The strategy relied upon the parents being able to make risk assessments from the information contained in the newsletters, rather than relying upon media interpretation of risk, hence an acknowledgement that the "literacy levels needed for newsletters was high" (Interview 002).
This need for high literacy levels to interpret the information in the newsletters was a factor in the third assumption held by the information providers.

5.5.2.3 Parents as information providers

Data gathered under the heading 'audience behaviour' highlighted that the dissemination process was underpinned by the assumption that the children involved in the incident would have their information needs met by their parents. An informant linked this assumption to the previous assumption when talking about the community displaying a "very paternalistic, middle class reaction" (Interview 009), whilst even one individual who considered themselves to be one of the main sources of information for children also commented that "children were getting information from parents" (Interview 008). Other comments were also made along these lines.

> "if you have an anxious parent with you, you try getting a word in edgeways to a child" (Interview 013)
>
> "general impression [was] that they were getting information from parents or television" (Interview 008)
>
> "communication was with the parents" (Interview 002).

Picking up this last comment, when the assumption that parents would inform their children was noted, the analysis then went back to the data previously gathered under the heading 'validating concerns', where it was noted that it was parents concerns that were considered by the information providers, not the children's concerns.

> "meetings were to talk to the parents and answer questions" (Interview 005)
> "parents had the number if they were concerned" (Interview 007), "parents could see the sense if you were able to talk through the options" (Interview 008)
> "way in which it was presented encouraged parents to have confidence in the information" (Interview 014).

These comments underline the assumption that the information dissemination effort was aimed specifically at parents, or at the very least adults in the community.

The two readings of the data have thus identified the explicit criteria set for the dissemination process:

1. To stop panic
2. To maintain consistency
3. To validate concerns

The readings have also identified that the dissemination process was underpinned by a set of assumptions about the audience that were held by the information providers:

1. They were dealing with a well-educated, literate audience
2. Parents would pass the information on to their children
3. Not actively seeking information meant satisfaction with the information supplied

Two key elements of the research project have now been considered in relation to the key informant interview data, issues generated by the research aims (the dissemination criteria) and issues raised by informants (the assumptions underpinning the dissemination process). The final reading of the data, therefore, considers the elements of the effective dissemination model generated by the qualitative systematic review in relation to the dissemination process during the suspected TB incident.

5.5.3 Effective dissemination

5.5.3.1 Targeting information

The third and final reading looked for data relating to the important elements of the effective information dissemination model (See Section 4.10.4). This analysis focused upon two factors, targeting information and opinion leaders as the third factor in the

model, willingness to accept new knowledge, relates specifically to the information recipient and not to the information providers interviewed at this stage of the project. Data collected from this reading of the text were collated under four headings, and data previously collected under the headings 'parents and communication' in earlier pathways was also incorporated in this analysis. The headings were:

1. Literacy levels
2. Children's needs
3. Measures taken
4. Opinion leaders

The first factor considered in this third analysis of the data, therefore, was the concept of targeting information. The previous analysis had highlighted that information was targeted at parents, rather than the children involved in the incident. This analysis, therefore, sought to highlight the extent to which children were even considered to be a target audience. The principles of social marketing which underpin many health information campaigns state that the product, in this case the information, "should be developed by analysing the needs of target audiences and designing products and services that are responsive to those needs" (Freimuth, 1987). Identifying children as a target audience in the suspected TB incident requires that information is presented in a suitable format for this audience. At the time of the incident the majority of the children involved were between the ages of seven and eleven years old.
In this incident the information providers identified that the children needed protection.

> "our responsibility [is] to protect the health of the children"(Interview 009)
>
> "these kids need protection" (Interview 002)
>
> "we have taken our children to the pool, we have exposed them" (Interview 007)

Protection was interpreted by some information providers as playing down the incident, "should be kept low profile for the sake of the children" (Interview 003), and "[we] didn't want to suggest that those who had it were contagious, or different, or difficult" (Interview 001).

The identification of children as possible information recipients was made by information providers, but at too late a stage in the incident for any specific measures to be taken.

> " we wanted to get the children to produce their own newsletter" (Interview 009)
>
> "we thought that the children could have contributed themselves to the information that was given, but it was too late" (Interview 012)
>
> "too late to do anything" (Interview 002)

With hindsight, at least one information provider considered not specifically providing information for children to be a fault in the strategy, "we should have thought harder about the children" (Interview 009).

So, if no specific measures were taken to tailor information for the children, how appropriate was the disseminated information for this audience? The newsletters (See Appendix 1) were not particularly appropriate for child readers, being considered by interviewees as "not user friendly,[because of] jargon, [and the] closeness of the type" (Interview 001) who noted that "the literacy levels needed [for the newsletters] were high" (Interview 002). Indeed, this was part of the reason why some information providers re-interpreted the information despite the desire for consistency of information provision.

> "we explained what the letters said" (Interview 001)
>
> "we put a line in our monthly newsletter"(Interview 007).

Some providers of information that was available to the children, and indeed adults who did not meet the literacy levels required of the newsletters, did attempt to tailor their information more closely to this audience.

> "our coverage was informative [and] we work in conversational English" (Interview 011)
>
> "fact sheets were written in fairly, straightforward language" (Interview 013).

One information provider commented that "they [the children] seemed to think it was appropriate to ask me for advice" (Interview 008), whilst another took it upon themselves "to speak to the children trying to allay their fears" (Interview 014). Thus, whilst there was no specific strategy to tailor information for the children involved in the incident, individually information providers did in a number of cases attempt to provide information specifically for the children.

This aspect of providing information for the children is explored further in the next phase of the research, which includes a questionnaire survey of children involved in the incident and asks the children about their sources of information during the incident.

5.5.3.2 Opinion leaders

The second factor considered in this analysis was the concept of opinion leaders, the linking factor between the information provider and the information recipient in the effective dissemination model. At this stage the analysis only considers the information provider's perspective.

None of the information providers identified themselves as opinion leaders in the community. Rogers (1995) six characteristics of opinion leaders are:

1. Opinion leaders have greater exposure to mass media than their followers
2. Opinion leaders are more cosmopolite than their followers
3. Opinion leaders have greater change agent contact than their followers
4. Opinion leaders have greater social participation than their followers
5. Opinion leaders have higher socio-economic status than their followers
6. Opinion leaders are more innovative than their followers

The data required to identify information providers who might be opinion leaders according to these characteristics was not collected in this study. The emphasis in this research project was focused upon perceptions of opinion leadership rather than the definitive identification of individuals as opinion leaders. There were individuals within the information providers who might possibly have been perceived as opinion leaders due to their role in the incident, and might well possess the characteristics listed above but this was not verifiable from the data collected. These individuals were "doctors who were treating the children. Their children were affected [and] what we were able to say to the public was look what I am really telling you is that we are going to do for all of you what I want to do for my own children" (Interview 009). This statement has echoes of Coulter's (1999) call for a partnership between doctor and patient based upon "mutual respect for each other's skills and competencies." The statement also reflects the sociological perspective of risk which highlights trust and credibility as assets in the risk communication process (Covello, 1989).
The interview comment suggests that there was an attempt to utilise potential opinion leaders in the dissemination process, however, determining the success or otherwise of the strategy requires further investigation. The issue of opinion leaders will, therefore, be explored in the next phase of the fieldwork, the questionnaire survey, when the viewpoint of the information recipients will be sought.

This final stage of the analysis highlighted that two of the three linking factors of the effective dissemination model were part of the dissemination process during the suspected TB incident. However, an assumption made by the information providers that parents passed the information on to the children, highlighted that further exploration of the concept of targeting information was needed. The next stage of the research will, therefore, investigate whether this assumption was correct, and if not where did the children receive information from.

5.6 Conclusion

The key informant phase of the fieldwork for this project was designed to determine the specific criteria set for the dissemination process in Ponteland. The sampling strategy employed in the study was successful in recruiting individuals involved in all the aspects of the formal communication process during the suspected TB incident. Analysis of the interview data highlighted three specific criteria set for the dissemination process, thereby achieving one objective of this research project. The analysis, however, also highlighted that the criteria were linked to assumptions held by the information providers about their intended audience. These assumptions require further exploration with the recipients of the information before their veracity could be confirmed.

In addition, the application of the model of effective dissemination to the dissemination process during the suspected TB incident, also suggested aspects of the process that required clarification and substantiation, the role of opinion leaders in the dissemination process and children's information sources.

The key informant interviews have, therefore, provided the researcher with a comprehensive picture of information dissemination from the perspective of the information provider. To complete this picture, however, the information recipient's perspective of the process is now required. The next chapter discusses the questionnaire survey and telephone interviews employed to gather data from the information recipients' perspective.

6.1 Introduction

This project sought to include in the evaluation of the dissemination process the perspectives of both the information providers and the information recipients. Previous research (Buckland 1995, Hampson 1995, Mackay 2000) identified the importance of informal communication sources in consumer health information provision. This aspect of information provision during the suspected TB incident is specific to the information recipients and was explored in the questionnaire survey. The model of effective information dissemination derived from the qualitative systematic review (See Section 4.11) highlighted the factors that contribute to the overall effectiveness of information dissemination, that are solely applicable to the information recipient and, therefore, outside the control of the information provider. These factors included the individual's awareness of information sources, their recognition of the need for new knowledge, their willingness to change as a result of new knowledge and their information seeking style. With a time lapse of two years between the incident and the research it would be difficult for individuals to recall aspects of their behaviour during the incident, such as their recognition of a need for new knowledge and their willingness to change as a result of new knowledge. Clandinin and Connelly (1998) point out that "memory, unaided by field texts has an uncertain status and, for the most part, expresses a current voice rather than a historical voice." However, with the inclusion of descriptive statements in the questionnaire it was anticipated that respondents would be aided in their recall of their awareness of knowledge sources. In addition, the questionnaire was designed to facilitate an overview of the respondents' information seeking styles from their responses to a range of questions.

This phase of the research also sought to verify if the assumptions held by the information providers about their audience during the suspected TB incident were correct. In order to verify the assumption that parents passed information on to the children involved in the incident, responses were sought from both adult and child respondents.

This chapter discusses the design and implementation of the questionnaire, the sampling strategy employed and the findings from analysis of the data. The rationale for conducting further interviews and the findings from these interviews is then

discussed. The chapter concludes by discussing the insights gained from both the key informant interviews and the questionnaire survey and follow-up interviews. The implications for the model of effective information dissemination are also considered.

6.2 Questionnaires

6.2.1 Rationale

Sapsford & Jupp (1996) assert that there is "no single best way of collecting data; the method chosen depends on the nature of the research questions posed and the specific questions you want to ask respondents." Used in conjunction with qualitative interviews questionnaire surveys are a useful means of gathering responses to supplement the interview data, or to provide data that will inform the questions to be raised in subsequent interviews. As Bryman (1988) notes "quantitative and qualitative research are most frequently united in order to fill some gaps in knowledge [where] the gaps cannot readily be filled by a reliance on participant observation or interviewing alone". In addition, by employing a questionnaire survey access may be gained to participants who might otherwise be unwilling to grant the time required for an interview. In this research project a questionnaire survey was employed, in the first instance, to gather data to supplement that previously collected in the key informant interviews. However, in the event of the questionnaire responses indicating areas of the information dissemination process not previously considered in the research, the responses will be used to inform questions in subsequent interviews.
Questionnaires are "perhaps the most popular of all the data collection instruments employed in statistical work" (Wilson & McClean, 1994). They have the dual benefits of being able to be administered in large numbers and without the presence of a researcher, in the case of postal surveys, and providing data that is easily codified, a particularly pertinent consideration if data input is undertaken by a number of individuals. In this study a questionnaire survey was employed to:

1. Gather the responses of participants in numbers that would have been impractical to interview

2. Elicit the views of respondents who might otherwise be unwilling to participate in an interview
3. Collect a large number of responses in a short time-scale

Postal surveys typically include a date by which respondents are requested to reply, usually within three weeks of the original distribution date (Heather & Stone, [n.d.]), thus the time-scale for the collection of the bulk of the questionnaire data is contained within this boundary. Questionnaires are, therefore, "far quicker to conduct than any other highly-structured data collection method" (Wilson,1996). As Oppenheim (1992) notes, however, "the world is full of well-meaning people who believe that anyone who can write plain English and has a modicum of common sense can produce a good questionnaire." However, producing a 'good' questionnaire requires a considerable amount of thought and effort by the researcher.

6.2.2 Retrospection

The questionnaires sought to obtain information from the participants about a past event, a "retrospective report" (Peterson, 2000). Sudman and Bradburn (1982) suggest that the ability to recall an event is linked to the time elapsed and the salience of the event, thus "for highly salient events such as major accidents or illnesses, periods of two or three years appear to be possible." If the suspected TB incident could be described as a 'major accident or illness' the questionnaire survey was conducted at, or near, the limit of the time elapsed which it is suggested it is feasible to expect respondents to recall.
There are, however, some issues relating to recalled events in questionnaire responses. Peterson (2000) advises there are three types of reporting errors that are of concern when respondents are asked to provide retrospective reports:

1. Errors of omission
2. Errors of commission
3. Telescoping errors

Of these three types of error, telescoping errors are not applicable in the situation of the suspected TB incident questionnaires as respondents were not being asked to place

their behaviour in a specific time period, e.g. last month, in the last six months, therefore 'telescoping' which refers to reporting behaviour before or after its actual occurrence was not a particular issue.
Failing to report behaviour, an error of omission, and falsely reporting behaviour, an error of commission, were possible responses in this survey. Foddy (1993) advises that the use of memory cues increases the likelihood of accurate recall of events. At the beginning of the questionnaire, and also in the covering letter, cues were given to remind the respondents of the events surrounding the suspected TB incident. Child respondents were encouraged to remember how old they were three years previously, what school class they were in, and who their teacher and friends were. In addition, the covering letter talked about taking pills for six months and having injections and x-rays. These cues would, it was hoped, encourage greater recall of the events for the respondents.

6.2.3 Defining the survey aims

The first question a researcher must ask when designing a questionnaire is what do they want to learn from their respondents. In cases where the research is being conducted on behalf of an organisation or funding body, it is essential that both the researcher and the organisation, or body, have a clear idea of the research goals to ensure that the data collected by the questionnaires is relevant. When the research is being conducted both for and by the researcher the problem does not arise, but it is important, however, that the researcher has a clear idea of the research goals and their relation to the questionnaire design before embarking upon the survey.
In this research the questionnaires were designed to collect information from respondents in respect of:

1. The criteria specified for the dissemination process by the information providers
2. The assumptions held by the information providers about their intended audience
3. The informal elements of the dissemination process
4. The respondents information seeking styles

The information providers during the suspected TB incident had three explicit criteria for the dissemination process. They wanted to maintain the consistency of the information disseminated across the range of information, for the information to stop any panic in the community and to validate the concerns of the community. The questionnaires, therefore, sought to determine whether the information providers reassured the members of the community through the dissemination process, whether the various sources of information accurately reflected the circumstances of the incident and also whether the respondents had the opportunity to raise their concerns with appropriate officials, and if so were these concerns allayed.

The assumptions held by the information providers in relation to their intended audience were that parents passed information on to their children, non-attendance at meetings signified satisfaction with the information provision and that they were providing information to a well-educated, literate audience. The first of these assumptions had an immediate impact upon the design of the questionnaires. To ascertain whether this assumption is correct required responses from both parents and children. It was, therefore, necessary to design two questionnaires, one for adult respondents and one for child respondents. Whilst the issues of appropriate language, length and format of questionnaire are important for all questionnaire designs, they are particularly important when the questionnaire is intended for child respondents. Peterson (2000) advises " a question that might be acceptable for adults may not be for children because of differences in language capabilities." The adult and child questionnaires were, therefore, designed separately.

With respect to the remaining assumptions, the questionnaires needed to ask respondents about their reasons for non-attendance at meetings specifically, but also about their information behaviour in relation to other sources of information provided during the suspected TB incident. To collect responses in relation to the third assumption that the audience was well-educated and literate, the questionnaires sought to establish the respondents' education levels, their first language and whether they were familiar with the medical terminology used in the various forms of information.

Collecting the respondents' views regarding the informal elements of the dissemination process was a particularly important aspect of the questionnaire, as this information was specific to the information recipients and, therefore, not available from other sources. The questionnaires therefore sought to establish which informal

sources the respondents used, and the role these sources played in providing information.

With regard to the respondents' information seeking style, the questionnaires sought to identify respondent styles from their responses to a number of questions considering issues such as non-attendance, discussion about the incident with other individuals and satisfaction with the information provision methods.

Once the issues that the questionnaire ought to address have been identified, the next stage according to Peterson (2000) is to "develop and prioritise a list of potential research questions that will satisfy the information requirements."

6.2.4 Potential research questions

The research questions developed at this stage of the questionnaire design should be as specific as possible (Peterson, 2000). Analysis of the key informant interview data had already identified specific questions relating to the information dissemination process, such as were respondents reassured by the information provided and, in their view, did the information accurately reflect the situation. In addition, the assumptions held by the information providers about their audience suggested specific questions relating to respondents' education levels, first language, and whether information was passed to children by their parents.

As well as gathering data to complement the key informant findings, the questionnaire survey was also intended to gather data specifically in relation to the information seeking behaviour of respondents, and the importance of informal sources of information for this group. It has already been noted that friends and relatives are a key source of health information for many individuals (Buckland 1995, Mackay 2000). The questions developed for the questionnaire in this area, therefore, invited respondents to identify the informal sources of information they used during the incident. Questions developed in relation to information seeking behaviour included asking respondents to indicate whether they attended meetings, read the newsletters, watched or read the media coverage and sought information about the incident from other sources. In addition research questions also sought to identify if respondents did not seek information from any of the sources, why this was so.

Once a set of potential questions were developed the next stage in the questionnaire design is to evaluate the questions. Peterson (2000) suggests that researchers ask three questions about each intended question:

1. Can respondents understand the question?
2. Can respondents answer the question?
3. Will respondents answer the question?

Unless the answers to all three questions are affirmative, Peterson (2000) advises the question is not viable.

When designing questionnaires for child respondents it is particularly important that "the vocabulary and educational level of respondents should be considered when choosing particular words to use in a question" (Peterson, 2000). Porcellato et al. (1999) subjected their questionnaire designed for primary school age respondents to "extensive piloting to establish content validity." The questionnaires designed for the child respondents in this project were also piloted prior to distribution.

At this stage question wording that assumed respondents undertook an activity, such as reading a newsletter was changed to include a negative option. This change was made on the basis that whilst respondents could understand the question, they could not answer the question if they had not read the newsletters. Similarly questions that asked respondents to list the information sources they used were removed from the questionnaire on the basis that respondents might not understand the term 'information sources'. In addition, questions that required time and effort on the part of the respondent were deleted on the basis that some respondents would not answer these questions. Peterson (2000) notes "the more effort and time required to answer the question the less likely are study participants to answer."

At the end of this process decisions then need to be made with regard to the type of questions to be included in the questionnaire, the plan and the format of the questionnaire.

6.2.5 Questionnaire format

6.2.5.1 Structure

"An effective questionnaire is carefully structured to provide valid and reliable information at a reasonable cost" (Peterson, 2000). Like an interview, a questionnaire is a two-way communication process between the researcher and the respondent. However the success, or otherwise, of this communication process depends upon decisions and activities made by the researcher before the respondent answers the first question.

Questionnaires vary in the degree to which they are structured. Highly structured questionnaires ask all the study participants the exact same questions in the exact same order and "all question answers are pre-determined; only closed-end questions are used" (Peterson, 2000). Semi-structured questionnaires, on the other hand, incorporate a degree of flexibility in their design by including open-ended questions, which permit the respondent "to formulate their own style of response" (Wilson & McClean, 1994). Flexibility can also be incorporated into a questionnaire by employing adaptive, or tailored questioning (Peterson, 2000). In this type of questioning the number of questions asked depends upon the responses given to previous questions. The technique is used to quantify respondents' attitudes and perceptions, by requiring the least responses from individuals with particularly strong attitudes and the most responses from individuals with moderate or ambivalent attitudes. This type of questioning is not however suitable for a postal survey as it relies upon interaction between the respondent and the surveyor to determine the number of responses required.

The questionnaire employed in this research project was highly structured and consisted of closed-end questions, however, respondents were also given the opportunity to include their own comments at the end of the questionnaire.

6.2.5.2 Types of question

The two basic types of questions employed in questionnaire design are open-end questions and closed-end questions. Although as Sudman & Bradburn (1982) note, these terms should really be open-answer and closed-answer, as it is the answers that

are left open or closed not the questions. In closed questions the respondent is provided with a set of possible answers to the question, from which they are invited to select their response. Open questions on the other hand invite respondents to reply to a question in their own words. Each type of question has advantages and disadvantages for both the researcher and the respondent (See Figure 12).

Open Questions

Advantages	Disadvantages
Freedom and spontaneity of the answers Useful for testing hypotheses about ideas or awareness	Time-consuming Coding: very costly and slow to process and may be unreliable Demand more effort from respondents

Closed questions

Advantages	Disadvantages
Require little time No extended writing Low costs Easy to process Make group comparisons easy	Loss of spontaneous responses Bias in answer categories Sometimes too crude May irritate respondents

(Figure 12 taken from Oppenheim, 1992)

Questionnaires often include both types of questions. The questionnaire designed for this project employed closed questions to ensure that the questionnaire was easy and relatively quick for the respondents to complete. The inclusion of space at the end of the questionnaire was designed to provide some compensation for the loss of spontaneous responses due to the closed question format.

6.2.5.3 Attitude statements

The majority of the questions in the questionnaire survey were designed as closed questions whose "answer alternatives were graduated to measure a continuous construct, such as attitude, opinion, intention, perception or preference" (Oppenheim,

1992). This questionnaire sought to evaluate the information dissemination process from the perspective of the information recipients, thus this type of question was appropriate in this context. In addition, the researcher had successfully employed the technique in a previous research project (McTavish & Duggan, 1999).

Oppenheim (1992) suggests that the "traditional method of measuring attitudes is by means of attitude statements." An attitude statement is a "single sentence that expresses a point of view, a belief, a preference, a judgement, an emotional feeling, a position for or against something" (Oppenheim, 1992). A number of attitude statements were, therefore, constructed around the theme of the effectiveness of the information dissemination process from the perspective of the respondent, and the importance of the informal sources of information. As Sudman and Bradburn (1982) note attitudes, opinions and beliefs are all "psychological states that are in principle unverifiable except by the report of the individual." Oppenheim (1992) however advises that "for the purposes of verbal measurement, most researchers seem to agree that an attitude is a state of readiness, a tendency to respond in a certain manner when confronted with certain stimuli." In research terms the stimuli will be a question in an interview or questionnaire. Respondents, for example, might not have articulated their attitude towards an issue before they are asked a specific interview or questionnaire question relating to the issue, but this does not necessarily mean that they did not have an attitude towards the issue (Oppenheim, 1992).

Formulating attitude questions requires careful consideration by the questionnaire designer. Care must be taken to ensure that words used in the statements hold the same meaning for both the researcher and the respondent. Sudman and Bradburn, (1982) for example, cite words such as profits, welfare, big business and civil rights, which have been found to be open to various interpretations and, therefore, responses. In this study phrases such as 'easy to read' and 'readily available' were considered to be open to various interpretations and were therefore removed from the list of possible attitude statements. Peterson (2000) also advises against the use of unfamiliar words e.g. diffusion or dissemination, and highly technical words or jargon.

Once the attitude statements have been refined it is then necessary to decide how the respondents will indicate their attitude to the statement.

6.2.5.4 Rating scale

Respondents are generally asked to signify their attitude towards a statement by indicating the strength of their response from a scale of potential responses. Peterson (2000) advises that researchers must make three major decisions when employing a rating scale response mechanism:

1. How many scale categories should be used?
2. What verbal stimuli should be used to label categories?
3. What should the physical scale form or configuration be?

Sudman and Bradburn (1982) suggest that rating scales with more than five points should not be administered verbally, but rather should employ a visual aid of some description. Although Peterson (2000) notes a "widely held belief that the proper number of rating scale categories should be 7, plus or minus 2." Sudman and Bradburn (1982) contend that whether to give respondents an odd or even number of response categories is "a much-debated point." The selection of an appropriate rating scale also depends upon the particular question being addressed, the context within which the questionnaire is administered, the characteristics of the respondents and the preferences of the researcher.

For this research project respondents were asked to signify their strength of agreement or disagreement with an attitude statement by circling a number on a range of 1 to 6, where 1 indicated strong agreement and 6 indicated strong disagreement. Respondents were also given the opportunity to indicate that any particular statement did not apply in their situation by circling the number 7 on the scale. An even number of categories were selected on the basis that rather than respondents indicating a neutral or indifferent response due to lack of recall, the opportunity to indicate that they had no knowledge in relation to the statement meant that selecting one of the six categories was an indication of recall and strength of feeling.

The verbal stimuli adopted for this questionnaire was intensity stimuli i.e. strongly agree or strongly disagree. Other possible stimuli such as requesting the frequency of an action or comparing one statement with another were not appropriate for the questions posed. In addition only the extreme values of strongly agree and strongly disagree were given. The question of whether all categories should be labelled and if

so, how, is the subject of debate in the research community (Peterson, 2000). Discussion centres on whether labelling all the categories might lead to inadvertently influencing responses. In this project, for reasons of space as well as a desire not to influence responses, only the extreme categories were labelled.

The final design decision relating to the rating scale concerns the visual representation of the response scale. A variety of mechanisms are available to researchers, therefore, decisions must be made as to whether respondents tick a box, circle a number or place a mark on a line. In this instance, respondents were asked to circle a number for all of the questions requiring a rating scale response. For consistency all dichotomous questions also requested that respondents circle the appropriate response. In addition, due to the considerations of space and length of the questionnaire rating scale responses were presented horizontally rather than vertically. Figure 13 below shows the format of the attitude statements and rating scale responses adopted in this questionnaire.

(Figure 13)

	Strongly agree					Strongly disagree	Not applicable
Newspaper coverage gave an accurate portrayal of the events in Ponteland	1	2	3	4	5	6	7
I first became aware of the incident through television coverage	1	2	3	4	5	6	7
Newspapers were only interested in the incident when it was a possible TB outbreak	1	2	3	4	5	6	7

The description above of the design and content of the questionnaire relates specifically to the questionnaire produced for adult respondents (See Appendix 14). The questionnaire designed for the child respondents involved a different set of design decisions.

6.3 Children's questionnaire

6.3.1 Consent and access

Research with child participants requires a "special approach" (Oakley, 1995). Particular concerns with respect to child participants are " the issues to do with consent, access, privacy and confidentiality" (Mauthner, 1997). Porcellato et al.

(1999) for example, obtained consent from "head teachers, parents and the children themselves" in their study of primary schoolchildren's perceptions of smoking. In Oakley's (1995) study on the other hand, of health and cancer prevention knowledge, and belief consent "was at the discretion of headteachers, [thus] in one school the head sought parental consent, and in the others children and young people were asked for consent." Solberg (1996) moreover noted in a similar situation that whilst consent was required from several authorities "the children themselves, who were to be interviewed, were not asked to give their consent." Hood et al. (1996) met with "a hierarchy of gatekeeping" in their attempts to gain access to child respondents and, moreover, found that they became "identified as a source of risk to those whom we wished to research." Mauthner (1997) reports that obtaining privacy to conduct interviews with child respondents can be a "sensitive issue", whilst Bricher (1999) notes that when interviewed with their parents "some children were constrained and others enriched by the parental presence."

Confidentiality was a particular concern for Doorbar (1997) who employed "post boxes for posting confidential messages; and a phone line operated with health service personnel available to offer counselling and advice on confidential matters." The success of these measures is apparent in Doorbar's comment that "the commitment and openness of all the children and young people involved in the project has been outstanding."

The children's questionnaires for this project clearly stated that completing the questionnaire was entirely voluntary and where the questionnaires were distributed personally this was re-iterated by the researcher. In addition, the letter attached to each questionnaire (See Appendix 11) also stated that participation was voluntary. With regard to the questionnaires distributed through the schools, and therefore taken home by the pupils, it is not known whether parents had any impact upon children's willingness to participate in the research. Response rates however suggest that more children returned completed questionnaires than did parents who received their questionnaire via children. Hood et al's (1996) description of parents as members of a hierarchy of gate keeping suggests that the parents in this study would have had some impact upon the response to the questionnaire; Bricher's (1999) comments indicate that this was not necessarily negative and the response rates would appear to support this.

Although access to child respondents can be problematic, in this particular research only one request for access was declined and that due to reasons other than the participation or not of the potential child respondents.

6.3.2 Questionnaire design

6.3.2.1 Order

Sudman and Bradburn (1982) advise researchers to "avoid asking demographic questions first." They also advise, however, to "start with easy, salient, non-threatening but necessary questions." It was anticipated that child respondents would find questions about their gender, age and first language easy and non-threatening, thus these questions, despite the above advice, were placed at the beginning of the questionnaire. The questionnaires designed for adult respondents, on the other hand, followed Sudman and Bradburn's advice and asked for demographic information at the end of the questionnaire.

The questionnaires for child respondents were designed to gather information on one aspect of the information dissemination process – where did children in the community access information during the suspected TB incident? The questions included in the questionnaire were, therefore, few in number and, in deference to the audience, brief.

Porcellato et al's (1999) questionnaire survey of school age children was used as a model for the length of the questionnaire, two pages, and for the format of the demographic questions. The children's questionnaire asked five questions, four closed questions and one open question. Each question was piloted with children in the same age group as the prospective respondents. The pilot respondents were asked to signify any difficulties or ambiguities with the questions and question wording was amended as a result.

The adult questionnaires were also piloted with respondents whose characteristics were similar to those of the intended respondents. Note was taken of the time taken to complete the questionnaires, any difficulties associated with the layout and format of the questionnaire and any ambiguity in question wording. As a result of this pilot survey a number of amendments were made to question wording for the final version of the questionnaire (See Appendix 12).

6.3.2.2 Covering letters

Sudman and Bradburn (1982) state that in postal surveys " the justification for the study is given in a letter that accompanies the questionnaire," whilst Peterson (2000) contends that "good cover letters are especially critical in mail surveys because they are frequently a researcher's only communication with targeted study participants." The cover letters for both the adult and child questionnaires (See Appendices 11 & 13) stressed the importance of the respondents' views in relation to the research. The letters were printed on University headed notepaper to stress the validity of the research. Edwards et al's (2002) systematic review of response rates to postal questionnaires found that "questionnaires originating from universities were more likely to be returned than were questionnaires from other sources." In addition, potential respondents were invited to contact the researcher, by e-mail or post, if they wanted to find out more about the research before completing the questionnaire. Potential respondents were advised that the contents of the questionnaires would remain confidential, and that completion was entirely voluntary. Sudman and Bradburn (1982) suggest that the cover letter should never be longer than one page, "since otherwise respondents would only skim over it or ignore it completely." Peterson (2000) moreover, contends "long introductions tend to lose study participants. They lead to low co-operation rates because they imply long, boring questionnaires." Neither of the cover letters for the adult or child questionnaires was longer than one page.

Sudman and Bradburn (1982), Oppenheim (1992) and Edwards et al (2002) all suggest providing a monetary incentive for return of the questionnaire can have a very positive impact on response rates. This option was not, however, incorporated into this survey due to the nature of the research funding and the anonymity of the responses.

With the cover letters (See Appendices 11 & 13) and questionnaires (See Appendices 12 & 14) now finalised the next stage of the process was to identify the potential participants.

6.4 Participants

6.4.1 Sampling strategy

A 'maximum variation' sampling strategy was employed in the questionnaire survey. This sampling strategy involves identifying "diverse characteristics or criteria for constructing the sample"(Patton, 1990). The intention is to collect data from individuals whose experiences of the suspected TB incident should be different due to their varying characteristics, although the event experienced, the suspected TB incident, was the same for all of the individuals. Kuzel (1992) suggests employing this particular sampling strategy when one "seeks to obtain the broadest range of information and perspectives on the subject of the study." Patton, (1990) moreover, considers that "any common patterns that emerge from great variation are of particular interest and value." To employ this sampling strategy, diverse groups within the community had to be identified and then strategies constructed to enable access to each group. Four initial categories of potential respondents were identified, whose experiences it was thought might have differed greatly due to the particular characteristics differentiating each group. The categories were:

1. Adult residents in the community
2. Adults employed in the community, but not resident in the community
3. Children resident in the community
4. Children attending school in the community, but not resident in the community

The characteristics that differentiated the groups in these initial categories were age and residency in the community. These characteristics were selected because of the assumptions that children received information from their parents and non-attendance at meetings meant recipients were satisfied with the information. As the meetings were held in the evening, non-residents might have a different perspective on reasons for non-attendance.

Within two of these categories further sub-divisions could be made between groups of respondents who were closely involved in the incident, i.e. participants in the screening process, and groups whose involvement in the incident was purely as a

result of their residency or employment in the community. Thus the categories were expanded to become:

1. Adult residents with children involved in the screening process
2. Adult residents without children involved in the screening process
3. Adult non-residents employed in the community
4. Children resident and attending school in the community
5. Children resident in the community, but not attending school in the community
6. Children attending school in the community, but not resident in the community

It was anticipated that these categories of respondents would have had varying experiences of the information dissemination process during the suspected TB incident, due to a number of factors. Schools in the community, initially at least, were the main distribution points for information, groups without access to these distribution points, therefore, might have a different perspective on the dissemination process than groups who had ready access to this information source. In addition, children's perspectives may also have differed depending upon whether they attended school in the area, "host places for the infection" (Interview 001) where every child attending the school was involved, or schools outside the community where the numbers of children involved in the incident were much smaller. Although "living in Ponteland was not an indication of potential infection" (Interview 002) it was also anticipated that adults and children who attended school in the area or were employed in the area but resided outside the geographical boundaries of the incident, would also be able to provide a different perspective on the incident.
Once the categories were identified the next stage was to construct strategies to facilitate access to the respondents.

6.4.2 Gaining access

To facilitate access to the six identified categories of respondents, five routes were highlighted, as in some cases more than one category of respondents could be accessed by one route. The routes were:

1. Via schools in the community
2. Via sheltered housing in the community
3. Hand delivered to purposively selected homes in the community
4. Distributed through Youth Groups in the community
5. Via an employer in the community

Although one route was via an employer in the community, the schools were also identified as employing individuals who were resident outside of the geographic boundaries of the incident, and this supposition was verified during key informant interviews with education officials. Each route would allow distribution of questionnaires to groups in all six categories, if requests for access were successful. Thus by distributing questionnaires to both adults and children via the schools and Youth Groups all of the categories of potential child respondents would be covered. In addition by including questionnaires for teachers in the request to the schools, and for youth leaders in the requests to the Youth Groups, the questionnaires would be distributed to individuals in all of the categories of adult residents and non-residents. The second and third routes, through sheltered housing in the community and purposively selected homes were designed to facilitate access to potential respondents in the category of adult residents without children involved in the incident. The homes purposively selected in this instance were all in a retirement community within Ponteland, whose residents were at least fifty years of age. Although this selection strategy limited respondents to a specific age group, the purpose in selecting this route was to ensure that respondents were not parents of children attending schools in the community.

The final strategy, to distribute questionnaires via a large employer in the community, was designed to ensure access to potential respondents who were employed in the community but not resident in the community.

Although potential routes to respondents were identified before distribution of the questionnaires could begin access had to be negotiated with specific individuals.

6.4.3 Gatekeepers

Metoyer-Duran (1993) describes gatekeepers as "individuals who either limit access to information or restrict the scope of information" or "opinion leaders ... and facilitators who positively affect the transfer or use of information within an organization." In relation to research practice, Punch (1998) states that "gatekeepers can be crucial in terms of access." The questionnaire survey phase of this research project involved negotiation with a number of different gatekeepers to allow access to potential survey participants.

All but one of the identified routes to potential respondents required negotiation with gatekeepers. Hand delivery of questionnaires to the purposively selected homes in the retirement community was the only route whereby questionnaires were directly administered by the researcher to the intended recipients. The remaining routes required that permission for distribution was sought, and upon receipt of the permission distribution was either personally undertaken by the researcher or undertaken by the gatekeeper, or their representative, with no input from the researcher other than the covering letter.

Foster (1996) contends that "gatekeepers will be concerned to protect their own interests and the interests of group members from any threat posed by the research." When the participants to whom access is sought are children, gatekeepers are likely to be particularly concerned about any possible threats posed by the research process. Access to children was requested from two sets of individuals in this project, education officials and youth group leaders. Foster (1996) suggests that where researchers "have already established some form of identity in the eyes of gatekeepers they can capitalize on this when negotiating access." Only one of the education officials and youth group leaders, identified as gatekeepers, was unknown to the researcher. This individual was, however, one of the key informants interviewed in the previous phase of the fieldwork, and the request for permission to distribute questionnaires through the institution was made during the interview. Bell (1993) however advises that it is "unwise to take co-operation for granted."

Formal requests for access were, therefore, made to the individuals. Education officials were requested by letter, and the requests to the youth group leaders were made either in person or by telephone.

In all cases the request made to the individuals was designed to project a positive view of the prospective research, as Foster (1996) notes, "one factor that influences the response of gatekeepers to access requests is their preconceptions of research and researchers." The requests, therefore, explained the purpose and nature of the research, the methods to be employed, and the need for the inclusion of the potential participants views in the project. In many cases this information itself is sufficient to allow the research to proceed (Foster, 1996).

In this project all of the gatekeepers known to the researcher were willing to grant access to potential respondents. The request for access made during the key informant interview was also granted, however, due to the time lapse between the interview and the questionnaire distribution staff changes in the institution meant that access had to be renegotiated. This second request for access was unfortunately declined. No specific reason was given for this decision, but perhaps the staff changes meant that an individual whose "preconceptions of research and researchers" were negative dealt with the request and thus the request was denied (Foster, 1996).

Accessing the gatekeeper and, thereby the residents of the sheltered housing accommodation was facilitated by an introduction through an individual known to both the researcher and the gatekeeper. This individual was able to verify the integrity of the researcher and the research project. In addition the researcher explained personally the purpose and nature of the research, the methods to be employed and the need for inclusion of the potential participants views. A copy of the questionnaire was provided and the precise details for returning completed questionnaires were explained to clarify the exact nature of the input expected from both the gatekeeper and the residents. These measures were successful in obtaining permission to distribute questionnaires to the residents.

The request for permission to distribute questionnaires to the employees of an organisation in the community was also made in the course of a key informant interview. In these circumstances the nature of the research and the researchers credentials have already been established, when the request is made. Again copies of the questionnaire were provided and the mechanics of responding to the survey explained to illustrate the small amount of time required of participants in completing the questionnaire. The consequence of these actions was that permission was granted to distribute questionnaires to the organisation's employees.

At the culmination of this process all of the identified gatekeepers had acceded to the requests for permission to distribute questionnaires. Access is only one half of the request and does not necessarily mean that the potential respondents will participate in the research project as the problem experienced with the staff changes in the school illustrates.

6.4.4 Distribution

Once permission to distribute questionnaires was granted the next stage in accessing the respondents was to organise the distribution. Due to the different nature of the distribution points a variety of measures were adopted. The measures were:

1. Hand delivery to all residences in a retirement community
2. Distribution through an institution or organisation's internal mail system
3. Personally giving a questionnaire to individuals attending a meeting
4. Attaching a questionnaire for adults with a separate covering letter to a questionnaire distributed to children

The various methods resulted in the distribution of 105 questionnaires to child respondents (See Appendix 12) and 175 questionnaires to adult respondents (See Appendix 14). All of the questionnaires, including those distributed through an internal mail system, included a self-addressed envelope to encourage response.

6.5 Response

Wilson (1996) contends "questionnaire response rates are usually low, unless they engage the respondents' interests or the investigation is perceived to be of direct value to the respondent." Denscombe (1998) moreover, considers "there is no hard and fast rule about what constitutes an acceptable response rate." A response rate as low as 15% is not uncommon with large-scale postal questionnaire surveys.
Of the 280 questionnaires distributed for this research 90 questionnaires were returned, which represents a response rate of 32.1%. Response rates from adult and child questionnaires were 32.6% (57 replies) and 31.4% (33 replies) respectively.

Oppenheim (1992) suggests sending out reminders to respondents who have not replied by the specified return date. In this instance, however, as the questionnaires were not distributed to named individuals, sending out reminders involved a second distribution to the entire sample. In addition, a second distribution would also require renegotiation of access with all of the gatekeepers. As both of these measures would possibly cause irritation and a negative attitude towards the research, re-distribution was not considered to be a feasible option in this case.

The main problem with non-response is the possibility of bias in the survey findings. Potential respondents who did not reply may differ in some material respect to those who did e.g. age or gender, and thus the subsequent analysis of the data would not incorporate the attitudes and opinions of this group. Denscombe (1998) identifies two types of non-response:

1. Non-response through refusal
2. Non-response through non-contact

Both of these types of non-response are considered here. Investigations into non-response from refusal revealed that a number of questionnaires were distributed to individuals who had moved to the area since the suspected TB incident. As a "major dormitory area for professional and managerial staff" (Northumberland [n.d]) and, therefore, subject to some movement in the population, it had been anticipated that inevitably some of the questionnaires would be distributed to individuals who were not actually resident in the community during the incident. The covering letter for both the adult and child questionnaires acknowledged that this was a possibility and advised potential respondents to disregard the questionnaire in this case.

Enquiries made to potential respondents, particularly child respondents, revealed that a number of respondents failed to respond to the questionnaire because they were unable to recall the incident in sufficient detail.

Neither of these groups of non-respondents differed in any material way from the respondents who returned the questionnaire.

With respect to the second type of non-response, stemming from non-contact, each distributed questionnaire was allocated an identifying number, the purpose of which was not to identify the individual respondent, but rather to identify the distribution method for each returned questionnaire. Analysis of the responses highlighted that no

replies were received from questionnaires distributed by one particular route. None of the questionnaires distributed to the employees of an organisation in the community were returned. Despite a second request to the gatekeeper in this organisation, it is possible that the questionnaires were not distributed to the potential respondents. Enquiries made at the time of the initial distribution request confirmed that, whilst some staff changes had occurred since the suspected TB incident, a number of the current employees had been employed in the organisation at the time of the incident. It is, of course, possible that these individuals did receive the questionnaires and chose not to respond. Again, however, whilst this group would have provided another perspective on the incident, they did not differ materially from the respondents who received questionnaires from other distribution sources. The lack of any response from this source, however, highlights one of the main problems associated with negotiating access to potential respondents through gatekeepers i.e. reliance upon the gatekeeper distributing the questionnaires. Mauthner (1997) noted similar problems in relation to accessing child research participants.

Consideration of the responses revealed that the sample of child respondents was not biased by age or gender. Analysis of the responses to the adult questionnaire, however, highlighted that female respondents were over four times higher than male respondents. One possible reason for this is that a number of the adult questionnaires were distributed via children through school and youth groups at the same time as the child questionnaires. It is thought possible that the majority of these questionnaires were passed to mothers, as the primary care-giver, rather than fathers, although the covering letter was addressed to the parent, with no indication of whether this was intended for males or females.

All age groups were represented in the final sample with the majority of the respondents in the 36 – 45 and 46 –55 age groups. This reflects the above average proportion of residents in the community in the 40 – 54 age group recorded by the Borough Council (See 2.2.1).

One final aspect of the questionnaire responses that might have had a bearing upon the representativeness of the findings was the fact that only two adult respondents indicated that English was not their first language. A further two adult respondents failed to reply to this question in either the affirmative or the negative. As the percentage of individuals in the community with a first language other than English is not known, it was not possible to determine whether this figure was representative or

not. At a later stage of the research interviews were conducted with individuals whose first language was not English to supplement the questionnaire findings and ensure that this perspective was incorporated in the evaluation process.
Oppenheim (1992) advises that with regard to bias "the safest option is to do no more than indicate the direction of the bias due to non-response." Thus, the reader is now advised that the findings discussed below possibly under-estimate the attitudes and opinions of males and non-English speakers in the community.

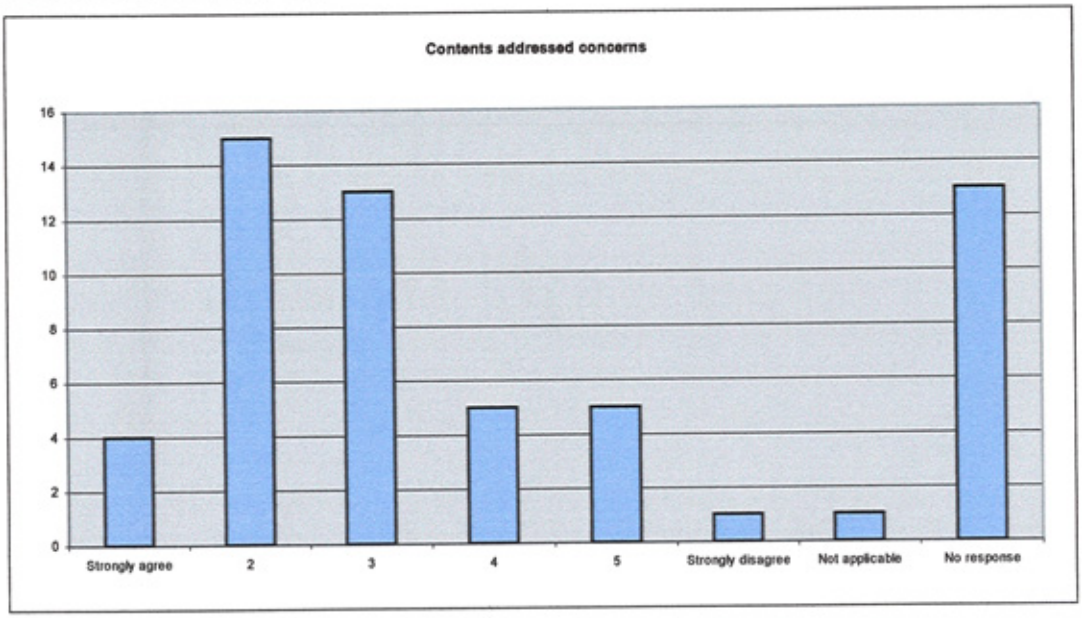
6.6 Analysis and Findings

6.6.1 Analysis

Quantitative analysis can be conducted at a number of levels, ranging from the lowest level, descriptive statistics, to the highest level, multivariate analysis (Denscombe, 1998). The level at which analysis is conducted depends upon the scale of the research, the nature of the data and the research aims. With a comparatively small sample size complex statistical manipulation of the questionnaire data in this research project was not appropriate. Analysis of the questionnaire data was, therefore, conducted at the lowest level providing descriptive statistics. In addition, due to the relatively small number of questionnaire responses, analysis was conducted manually. The majority of the adult questionnaire responses were in the form of rating scales therefore the data was available for analysis with no preparation other than collation required.
The aim of this phase of the research was to, in the first instance, gather evidence from members of the community to corroborate or refute the assumptions held by the information providers about their audience. In addition, the questionnaire data provides the community's perspective on the dissemination process and, thus, complements the data already gathered in the key informant interviews in relation to the criteria set by the information providers. The questionnaires, moreover, contain the only data available concerning the informal networks used by the information recipients as sources of information during the incident.
None of the aims of the research therefore required a higher level of data analysis than descriptive statistics.

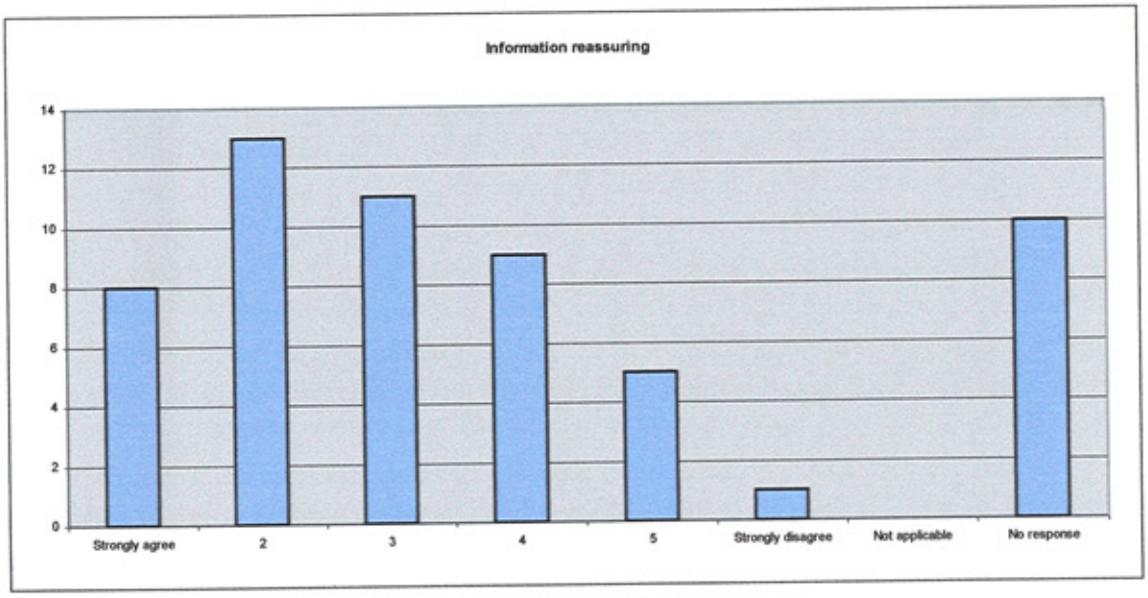
6.6.2 Validating the concerns of the community

The questionnaires were designed to gather data from the respondents relating to the criteria set for the information provision. One of these criteria was that the information disseminated would 'validate' the concerns of the community. Validate here meant acknowledging that the concerns were real and providing information to address these concerns. Respondents were, therefore, asked to indicate whether they agreed that newsletters addressed all of their concerns about the incident and also whether they agreed that they found the information provided in the newsletters reassuring. 48 respondents indicated that they had read the newsletters issued during the incident. Their responses to both of these questions are illustrated below (See Figure 14 and Figure 15).



(Figure 14)

The charts illustrate that a majority of the respondents who read the newsletters agreed that they found the information reassuring (Figure 14) and also agreed that the information addressed all of their concerns about the incident (Figure 15).



(Figure 15)

19 respondents attended the public meetings held during the incident. These respondents were asked to signify whether they agreed that the meetings were an opportunity to raise their concerns with appropriate officials and also whether they agreed that they felt satisfied after the meetings that everything possible was being done to protect the community.

16 of the 19 respondents who attended the meetings agreed that they felt satisfied after the meetings that everything possible was being done to protect the community and 17 of the 19 respondents agreed that the meetings were an opportunity to raise their concerns with the appropriate officials.

With regard to the media coverage of the incident 50 respondents indicated that they read newspaper articles about the incident and 51 respondents indicated that they watched television coverage of the incident. These respondents were asked whether they agreed that they found television coverage of the incident reassuring, whether they agreed that reading newspaper articles increased their concerns about the incident, and whether they agreed that newspaper coverage was not intended to reassure readers. The responses to these questions were mixed. 35 of the 50 respondents agreed that newspaper coverage was not intended to reassure readers, however, 34 of the 50 respondents disagreed that reading newspaper articles increased their concerns. 35 of the 51 respondents who watched television coverage of the incident also disagreed that they found television coverage of the incident reassuring.

In the final section of the questionnaire, relating to the informal sources of information, only three of the 30 respondents who expressed an opinion agreed with the statement 'talking to health officials increased my concerns', whilst 15 of the 20 respondents who expressed an opinion agreed that the contact number gave them the opportunity to discuss their specific concerns.

Did the information providers validate the concerns of the community?

The results above indicate that both the newsletters and the meetings did address the concerns of the respondents,who received information from these sources. The more popular sources of information, television and press coverage, whilst not reassuring their audiences did not increase the audience's concerns about the incident. The less formal sources of information, talking to health officials and using the contact number, although limited as a source of information for the respondents, did not increase the concerns of the respondents and did provide an opportunity to discuss specific concerns.
The questionnaire data therefore suggests that the information dissemination process did validate the concerns of the community.

6.6.3 Stop panic

The second of the criteria set by the information providers was to stop panic being created in the community. This criterion was related to the previous findings where respondents were asked if the information provided from the various sources was reassuring. As noted above the primary sources of information, the newsletters and the meetings, did reassure respondents who received information from both of these sources. In addition in relation to informal sources of information 28 respondents of the 39 who expressed an opinion agreed that it was reassuring to talk to other people in the same situation, whilst 27 of the 30 respondents who expressed an opinion disagreed that talking to health officials increased their concerns.
The main strategy adopted by the information providers to stop panic being created in the community during the suspected TB incident was to try and ensure that parents received information before the press. The premise of this strategy was that the press coverage of the incident might help to create a panic in the community. This premise

is borne out by the respondents' agreement (35 respondents) that newspaper and television coverage was not intended to reassure their audiences. In adopting the strategy the information providers however perhaps overestimated the importance of the press, as despite this view of the media coverage, 34 respondents also disagreed that reading newspaper coverage of the incident increased their concerns. This finding was also despite the fact that more respondents received information from these sources than from any of the other sources of information considered in the questionnaire. For some respondents, particularly those in the top two age groups, 56 –65 and 66+, media coverage was their main or only source of information about the incident.

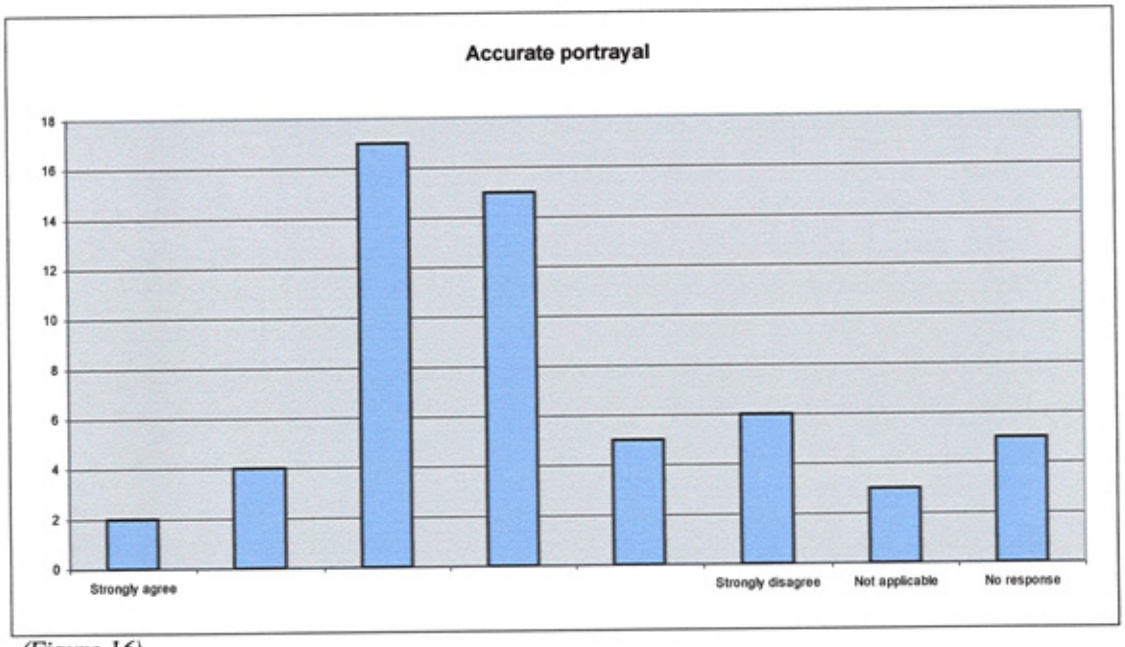
The questionnaire results indicate that the information providers were successful in reassuring the community with the information they disseminated, although the strategy of ensuring parents received information before the press was not a particular factor in achieving the objective of stopping panic in the community.

6.6.4 Maintaining consistency

The third and final criterion set for the information dissemination process was to maintain consistency across the range of the information provision. Respondents were thus asked whether they thought that information provided in the newsletters reflected the situation at the time and also whether the newsletters kept them up-to-date with what was happening. In both cases, the majority of the respondents, 38 and 39 respectively, agreed with these statements.

Respondents who attended the public meetings were also asked whether they thought the information given at the meetings reinforced the details given in the newsletters. Again the majority (16 of the 19 respondents who attended meetings) of the respondents agreed that this was the case.

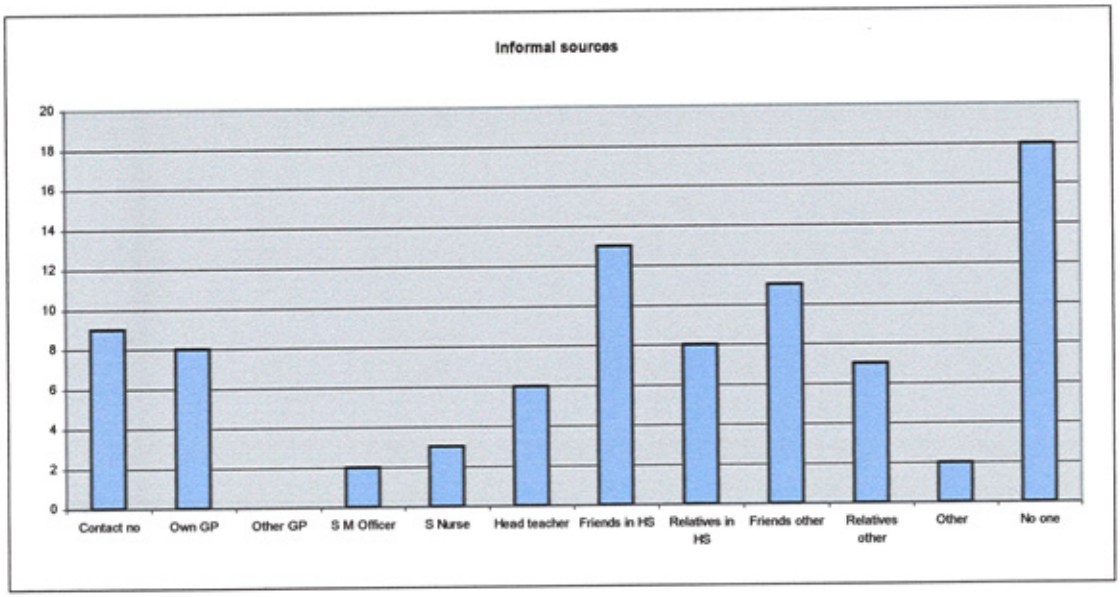
With regard to the media coverage, respondents were asked whether newspaper coverage gave an accurate portrayal of the events in Ponteland. The responses to this question were mixed, as the graph below shows (See Figure16).



(Figure 16)

Respondents were also asked, in relation to the informal sources of information, whether they received conflicting information when they discussed the incident with health professionals. 21 respondents disagreed with this statement and only 9 agreed. With regard to consistency however, respondents were also asked to indicate the informal sources of information that they used during the incident. 12 pre-defined categories of information source were supplied, which included a nil response option. Only one category, other GP, was not cited by any respondent. The frequency of responses for all categories are shown below (See Figure 17).

(Figure 17)



As this chart illustrates respondents consulted a wide range of information sources during the incident, over and above the newsletters, meetings and media coverage. This finding is consistent with other studies (Solomon, 1996) where informants reported using as many as 22 different sources of health information (See Section 1.8.2). Maintaining consistency across such diverse sources of information is a challenging undertaking. The questionnaire results indicate that the primary sources of information, the newsletters and the meetings, were considered to be accurate and up-to-date by the respondents. Respondents were, however, divided about the accuracy of the information received from secondary sources i.e. the media, despite these being highlighted in other studies as the second key source of health information (Stevens, Morris & Rolinson, 1996. Merry 1997, Mackay 2000).

The third key source of health information, friends and relatives, (Buckland, 1995 Hampson, 1995) were popular sources of information for respondents in this study. Personal experience, which is one of the factors attributed to the importance attached to this source (Buckland, 1995), is shown in this study in the popularity of friends employed in the Health Service as an informal source of information for respondents. Only 9 respondents felt that they received conflicting information from health professionals. The term health professionals in this context, however, may also have included friends and relatives employed in the Health Service. Communication between respondents and their friends and relatives is generally homophilous (See Section 2.2.4) and, therefore, more effective.

The questionnaire responses indicate that from the perspective of the information recipients the information provided was not consistent. Although in many instances the media coverage was based upon information from the newsletters (See Section 2.2.5) 38 respondents agreed that the newsletters reflected the situation at the time, whilst only 23 respondents agreed that the newspaper coverage gave an accurate portrayal of the events. This was the case even though a higher number of the questionnaire respondents read the newspaper coverage compared to the number of respondents who read the newsletters.

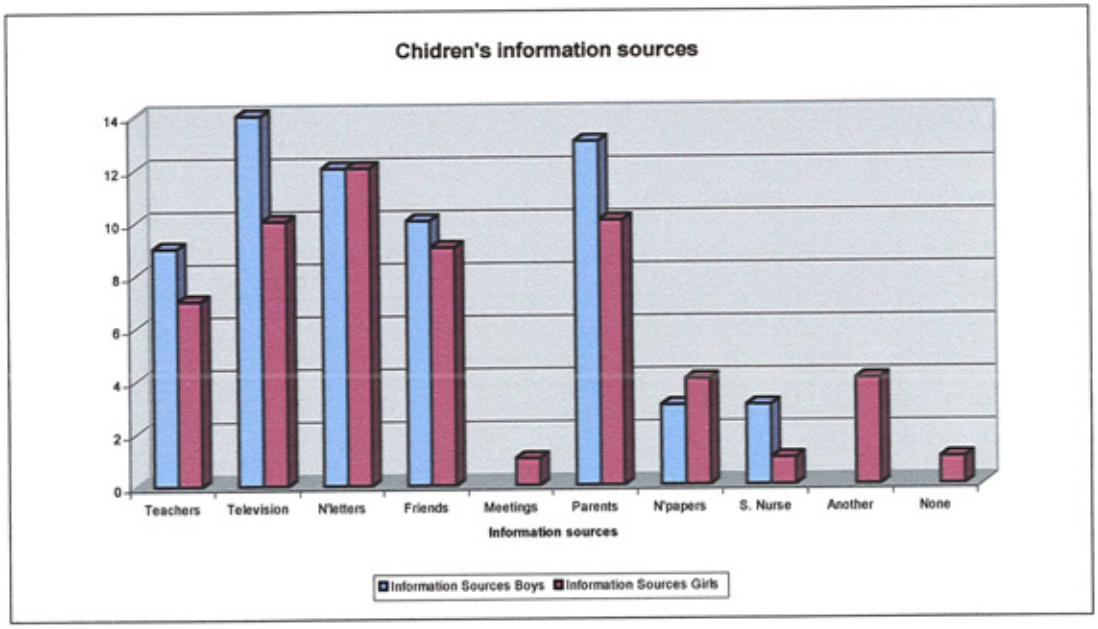
Analysis of the questionnaire responses, therefore, shows that the information dissemination process during the suspected TB incident met two of the three criteria set by the information providers. The information provided did stop panic being created in the community and did validate the concerns of the community. However,

the objective to maintain consistency across the range of information sources was not achieved.

The next stage of the analysis now considers the assumptions that the information providers held in relation to the audience.

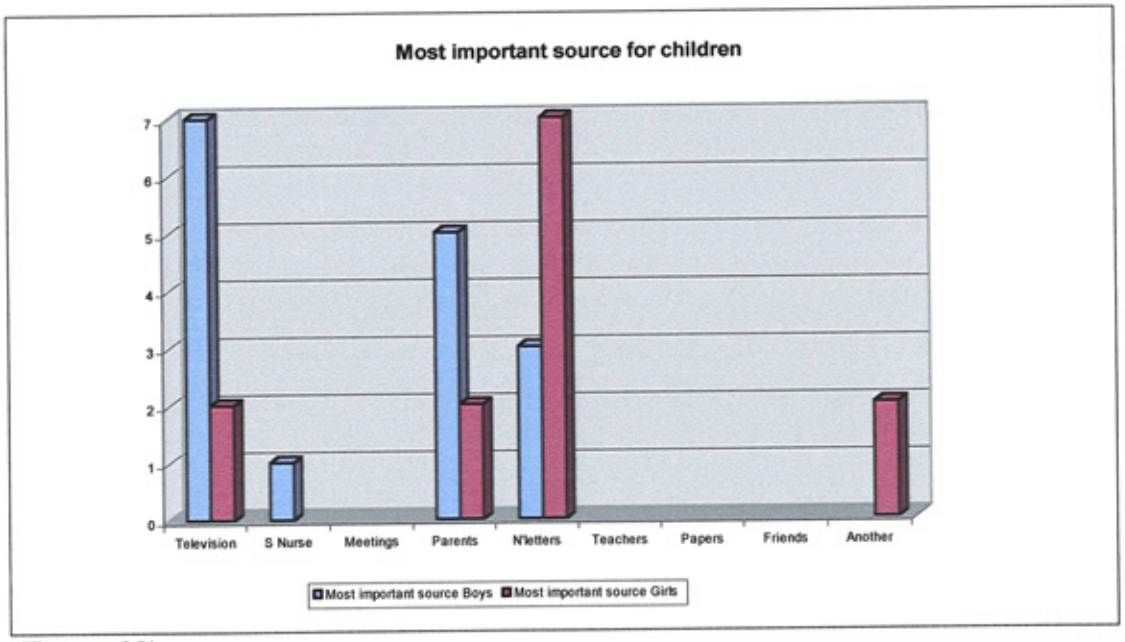
6.6.5 Children and information

Analysis of both the children's and adult's questionnaires was undertaken to determine whether the information providers during the incident were correct to assume that children received information from their parents. Child respondents were asked to identify any of the ways that they found out what was happening in Ponteland during the incident, from a list of nine possibilities. The responses received are shown in the chart below (See Figure 18).



(Figure 18)

The respondents were also asked to select the way, which explained most clearly to them what was happening in Ponteland. The responses to this question are also illustrated below (See Figure 19)



(Figure 19)

The graphs show that whilst the majority of the child respondents indicated that they received information from their parents, this was by no means their only source of information. The figures in the second graph (Figure 19) also indicate that the newsletters and television were as important sources of information for children as their parents.

The corresponding responses from the adult questionnaires reveal that adults were happy to discuss the incident in front of their children and did discuss the contents of the newsletters with their children.

When asked to explain how the information source explained most clearly what was happening children provided a variety of reasons, but simplicity and the authority of the source were the two most popular themes.

Doctor said germs were in our lungs asleep and they were causing no problems but they needed to get rid of them in case they woke up because then they would cause problems (0184)

All of my friends said different things so I decided the newsletters must be right (0195)

Because it was coming straight from school and the people at school knew all of the information and weren't making things up for a good news story (0130)

Parents could explain it in a simple way (0202)

Parents simplified it when they were talking to me (0174)

The news shows you pictures which stuck in your head (0121)

They (parents) explain it in ways I can understand the best (0123)

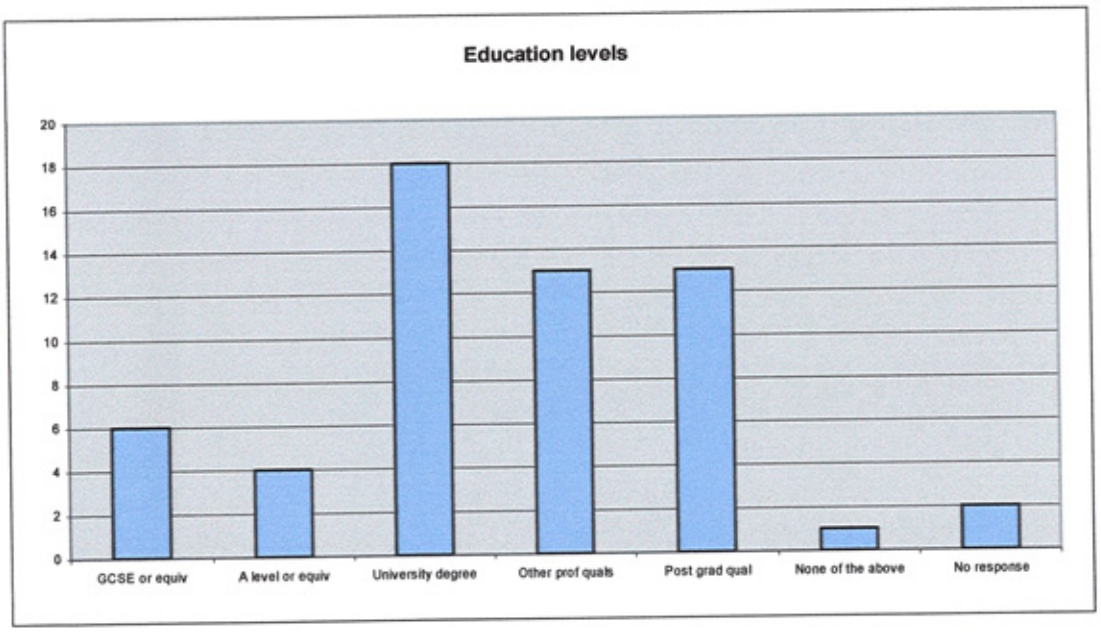
My mum was involved in hospitals at the time (0112)

The assumption by the information providers that parents passed information on to their children was in most cases correct. However, parents were not the only, or indeed, main source of information for children as the media were an equally as important source. The reasons put forward by the child respondents for this importance attached to the media was the simplicity of the information presented. Risk communication research suggests that the media's role is to translate and interpret risk assessments for a lay audience. The responses to the children's questionnaire indicate that this is a particularly important role when the audience is children. In addition, the importance of both parents and the media as information sources for the child respondents in this study might be explained by the different functions performed by the media and personal networks in diffusion research. In diffusion studies the media was found to *inform* the audience about the innovation, whilst interpersonal sources e.g. parents, then were found to *persuade* the audience to accept the innovation.

The questionnaire responses thus, whilst not entirely upholding the notion that children received their information from their parents, does not either completely nullify this assumption.

6.6.6 A well-educated and literate audience

Analysis of the key informant interview data highlighted that the information providers also assumed that their audience was well-educated and literate. The questionnaires therefore asked adult respondents to indicate their highest level of educational qualifications. The responses to this question are presented below (See Figure 20). In addition, respondents were also asked to indicate if English was their first language; only two respondents indicated that their first language was not English.



(Figure 20)

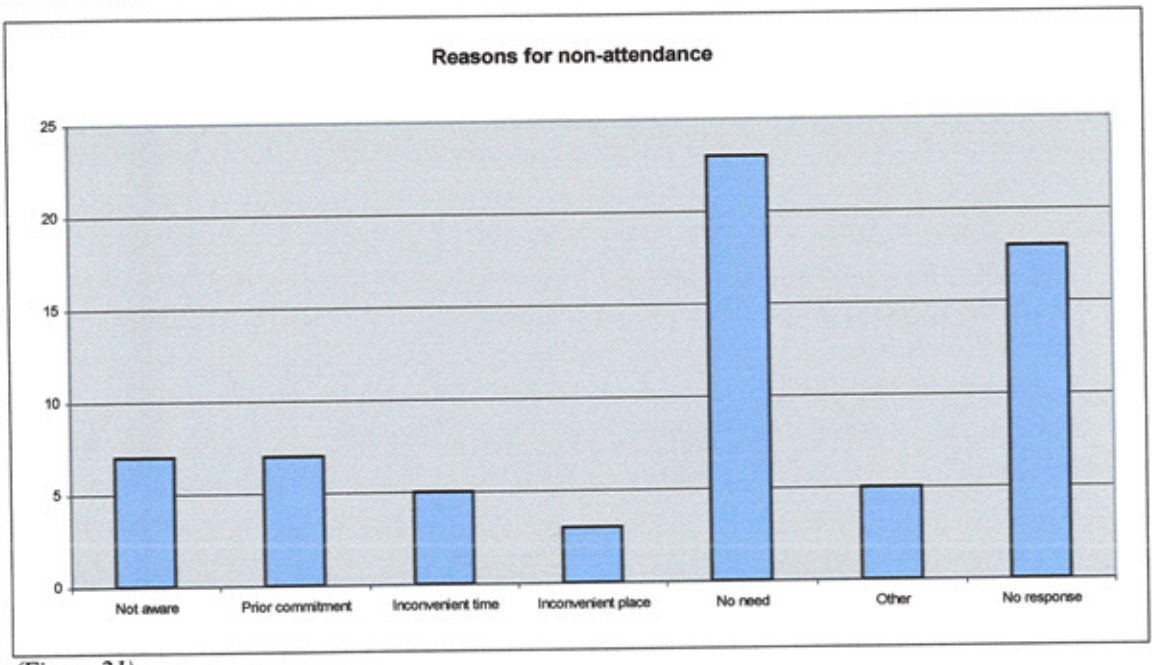
The chart above appears to support the assumption that the audience for the disseminated information was well-educated and literate. Over 30% of the respondents have degree level qualifications, and an ACORN profile of the community categorises the area as Type 1 which "comprises a highly educated population – almost 3 times the national level of residents have degrees" (Upmystreet, 2002).

In addition, when respondents were asked whether they agreed that medical terms that they were not familiar with were used in the newsletters or newspaper articles, the majority of the respondents, 34 and 37 respondents respectively, disagreed. 14 of the 19 respondents who attended the public meetings also agreed that the medical terms used at the meetings were always clearly explained. These results, therefore, suggest that the information disseminated during the incident was to a well-educated and literate audience.

However, questionnaires by their very nature require that respondents are literate, therefore respondents without the standard of literacy required to complete this questionnaire are not represented in the chart above. It is difficult to verify the extent to which this proviso might apply in this specific situation, therefore this result is presented with an acknowledgement that other methods of enquiry may produce a different finding.

6.6.7 Non-attendance equals satisfaction with the information provided

The third assumption held by the information providers was that non-attendance at meetings meant that the community was satisfied with the information being provided. 38 of the respondents indicated that they did not attend any of the public meetings held about the incident. These respondents were asked to indicate their reasons for non-attendance. Five pre-defined categories, and the option to specify another reason were provided for replies. The responses to this question are shown below (See Figure 21). Some respondents indicated more than one reason for non-attendance.



(Figure 21)

As the chart illustrates the main reason given for non-attendance at the public meetings was that respondents 'had no need for more information'. However, further consideration of the respondents information seeking behaviour is required before this assumption can be refuted or affirmed.

6.6.8 Information seeking behaviour

6.6.8.1 Information monitors

Miller and Mangan (1983) identified two distinct styles of information behaviour exhibited by individuals in stressful situations:

1. Information monitoring
2. Information blunting

Research (Miller & Mangan 1983, van Zuuren &Wolf 1991, Rees & Bath 1999) has demonstrated that these information seeking styles are neither age nor gender specific, nor indeed specific to a socio-economic class. Thus information providers cannot predict an individual's information seeking style based upon these characteristics. Van Zuuren & Wolf (1991) moreover, identified that individuals may adapt either of these information seeking styles alternately during a stressful situation.
Analysis of the questionnaires was, therefore, conducted to construct a model of the individuals displaying monitoring and blunting characteristics. In the specific circumstances of the suspected TB outbreak it is suggested that information monitors would have utilised all of the formal sources of information available during the incident, and also consulted other informal sources for further information. It was further suggested that these individuals would consider it important to know where the information they received originated, and would wish to hear information directly from the individuals managing the incident.
In addition, information monitors would be expected to view the public meetings as an opportunity to raise their concerns with the individuals involved, and also as a means of providing reinforcement of the information previously given in the newsletters. Furthermore, information monitors might also be reassured that the health professionals providing information were also personally involved in the suspected TB outbreak. Analysis of the questionnaires was therefore undertaken in the first instance to identify possible information monitors from the responses received.
17 respondents indicated that they:

- Read the newsletters

- Attended the meetings
- Read press articles relating to the incident
- Watched television coverage relating to the incident

All of the 17 respondents agreed that it was important to read the newsletters after the possibility of a TB outbreak receded. All 17 respondents also disagreed that they learned most about the incident from reading newspaper articles or watching television coverage of the incident.

14 of the respondents agreed that the public meeting provided an opportunity for them to raise their concerns and also agreed that it was reassuring to know that the health professionals providing the information were personally involved in the suspected TB outbreak. This finding suggests that opinion leaders, in this instance the health professionals, did perform an important function in the dissemination of information for information monitors at least.

Six respondents disagreed that the newsletters addressed all of their concerns. Miller and Mangan's (1983) research found that providing minimal information to information monitors increased their anxiety. In the specific circumstances of the suspected TB incident it is therefore suggested that these respondents viewed the newsletters as a minimal amount of information and were thereby made more anxious by receipt of the newsletters rather than less anxious.

Fifteen of the possible information monitors agreed that the information given at the meetings reinforced the details provided in the newsletters. When asked, however, whether there was any need to attend meetings after the possibility of a TB outbreak diminished the responses received were evenly distributed between those who agreed that there was still a need to attend meetings, 8 respondents, and those who disagreed, 8 respondents. One respondent chose not to indicate their preference. Van Zuuren and Wolf's (1991) research suggests that respondents, who felt that there was no need to attend meetings after the possibility of a TB outbreak receded, may have adopted an information blunting strategy as a result of their previous information monitoring activities. All of the respondents who agreed that there was no need to attend meetings after the threat of a TB outbreak had diminished had previously indicated that it was still important to read the newsletters after the possibility of a TB outbreak receded. Further research is, therefore, required to determine the extent to which

individuals adopt an information blunting strategy as a result of previous information monitoring activity. The responses to this survey indicate that the respondents continued to monitor information by reading the newsletters, although this was on a reduced scale compared to their previous activities.

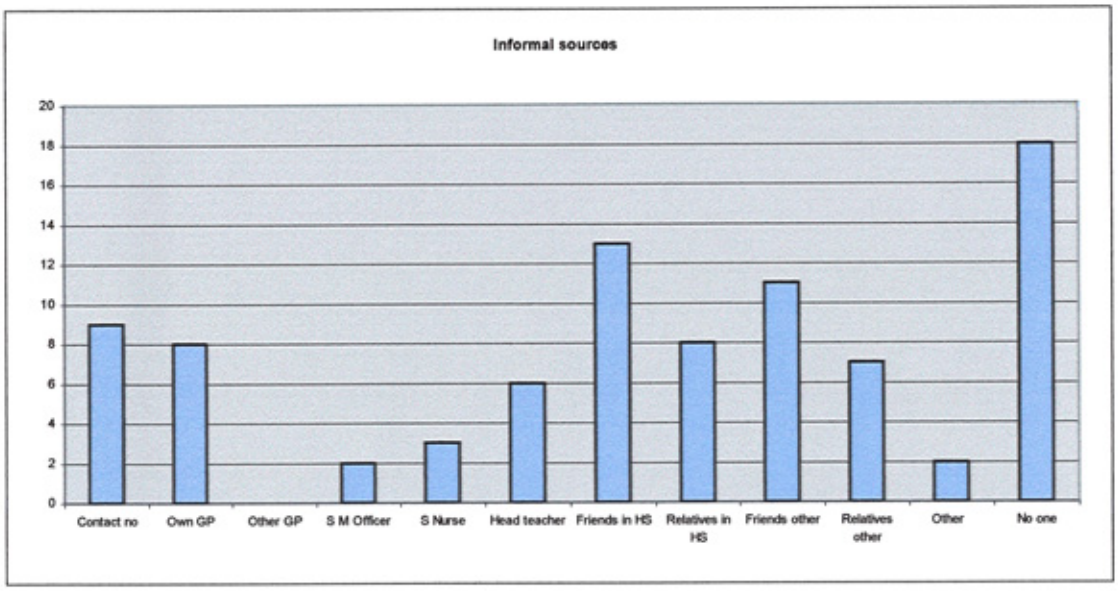
6.6.8.2 Information blunters

In the circumstances of the suspected TB incident it is proposed that an information blunter would not have utilised any information sources that required specific action on their part e.g. attending meetings, contact the Communicable Disease Unit or discussing the incident with other informal information sources.
38 respondents indicated that they did not attend any of the public meetings held about the incident. Of these 38 respondents, 8 also indicated that they did not read any of the newsletters issued during the incident. Although van Zuuren and Wolf (1991) found that information blunting was neither age nor gender specific, the 8 respondents identified as possible information blunters were all aged 56 years or over. 3 of these respondents did, however, watch television coverage about the incident and read newspaper articles about the incident. In fact, two of the respondents indicated that they were first alerted to the incident by television coverage, although only one of the three respondents agreed that they found television coverage of the incident reassuring.
The remaining five possible information blunters, who had not read the newsletters, nor attended any public meetings, nor read or watched media coverage of the incident did not contact any informal sources of information about the suspected TB outbreak. Comments provided by these respondents in the questionnaires, however, highlight the role of one of the factors in the model of effective information dissemination produced as a result of the qualitative systematic review (See 4.10.3) – the perceived relevance of the information. Respondents indicated that as a result of their age or other considerations information about the suspected TB incident had no relevance for them. Indeed, the three respondents who watched or read media coverage of the incident also indicated that the incident had personal relevance for them, either as a result of swimming pool use or through contact with children in the community. Van Zuuren and Wolf (1991) experienced difficulty in establishing the precise nature of information blunting activity, and the small number of responses relating to this facet

of information behaviour in this study echoes this finding. It may, however, be the case in this study particularly, that non-response to the questionnaire survey is another aspect of the information blunting activity in the community.
This study does, however, suggest that the relevance of the information may be related to the information behaviour strategy adopted. Further research is, however, required to determine the veracity of this statement.

6.6.9 Informal sources of information

One other aspect of the information dissemination process was considered in the questionnaire survey, the role of informal communication networks. Diffusion research suggests that informal communication is instrumental in persuading individuals to adopt an innovation (See Section 2.2.3). Respondents to the questionnaire were therefore asked about the type of informal information sources they consulted and their reasons for doing so.
41 respondents indicated that they were aware that the Communicable Disease Unit offered a contact telephone number during the incident, although only 9 respondents indicated that they actually contacted the Unit. Whitaker et al's (1994) study in the qualitative systematic review highlighted that the "offer of the senior manager's time could be perceived as evidence that the management is prepared to take the trouble to listen to the concerns of the staff." In Whitaker's study although the offer of one-to-one meetings with senior management was deemed to be beneficial by the staff, in the event the facility was little used. In the suspected TB incident, therefore, the provision of a contact telephone number may have been designed to foster trust and confidence in the community, whether or not the facility was utilised.
Respondents were asked to indicate which, if any, informal sources of information they contacted during the incident and were provided with a list of potential sources of information. The responses to this question are displayed in figure 17, and again here below for the reader's convenience (Figure 22).



(Figure 22)

Where respondents indicated an informal source, the most popular type of information source was friends, whether employed in the Health Service or elsewhere. Previous research (Buckland 1995, Hampson 1995, Mackay 2000) indicates that friends and relatives are important sources of health information for individuals, which these results confirm.

The homophilous nature of effective communication, noted in Sections 2.2.4 and 2.3.4, is also borne out by the popularity of both the categories of friends and relatives as an information source. Indeed, over half (32/57) respondents agreed that it was reassuring to talk to other people in the same situation, whilst only 9 respondents agreed that their reason for discussing the incident with friends was to help them understand the medical terms used.

Kasperson (1992) moreover, noted that "individuals do not act merely in their roles as private persons, but rather according to the role specification associated with their positions." Thus individuals who specifically contacted friends employed in the Health Service would expect them to provide information concurrent with their role as a health provider as well as the more informal role of friend.

Further clarification of the nature of the informal communication process was required to determine the importance of informal communication networks in the information dissemination process.

The questionnaire survey form invited respondents to indicate their willingness to take part in telephone interviews for the research project. 14 respondents indicated that they would be willing to be interviewed by the researcher.

6.7 Telephone interviews

6.7.1 Questionnaire respondents

The fourteen respondents who indicated their willingness to be interviewed represented a number of age groups and both male and female participants. Respondents were contacted with the interview request and asked to supply a more suitable date and time if the original contact was not at an appropriate time. Contact was attempted twice if no answer was received on the first attempt. Messages explaining the reason for the call were left where this was an option. As a result of these measures nine telephone interviews were ultimately conducted.
As with the key informant interviews a brief interview schedule was composed prior to the interview. The focus of the interviews was to explore the nature of the informal information sources used by the interviewees during the suspected TB incident. The questions posed in each interview were therefore:

- Who do you seek information from in circumstances such as the suspected TB incident?
- Why would you approach these specific sources for information?

An emergent research strategy was employed in this phase of the fieldwork, however, where previously unidentified issues would be explored in subsequent interviews. The interviews were not recorded but notes were taken during each interview. Analysis of the interview responses indicated that homophily was an important element of the use of informal information sources. All of the interviewees indicated that although the individuals from whom information would be sought are dependent upon the specific situation, a shared interest or outlook was an important consideration in the selection of an appropriate source. One interviewee, for example, an education professional talked about approaching an appropriate professional rather

than looking towards the inhabitants of the local pub for information (Tinterview 005). Whilst, others approached other parents with children of similar, or slightly older, ages to their own children on the basis that they would be expected to have a similar outlook to their own. Parents of children slightly older than the respondents' children would be approached if the information sought related to child development, for example, on the basis that they may have already experienced the problem and would, therefore, be able to provide a solution.

Two of the interviewees were themselves employed in the Health Services and found that their colleagues viewed them as a source of information, due to both their medical background and their personal involvement in the incident.

Interviewees also noted that when the incident occurred they did not have access to Internet-based information sources, and were a similar incident to occur now this would be an information source that they would undoubtedly utilise. As noted earlier (Section 1.8.3.1) however, concerns about the quality of information provided by this medium suggest that this information source should be used with caution.

6.7.2 Non-English language speakers

The interviewees and, indeed, the questionnaire responses did not represent the concerns of the non-English speaking community in Ponteland. Specific interview requests were, therefore, made of individuals whose first language was not English to remedy this deficiency in the data. Interviews were, thus, conducted with four individuals whose first language was Japanese. One of the four individuals acted as an interpreter for the remaining three participants, as the researcher spoke no Japanese. The interpreter was known personally to the researcher, which was undoubtedly a factor in their agreement to participate in the study. In addition, the interpreter routinely fulfilled this function for the other three individuals, and thus all four participants were comfortable with this aspect of the interview. These interviews were conducted face-to-face and notes taken rather than a tape recording.

These interviews highlighted issues that were possibly specific to non-English speaking individuals in the community. The participants indicated that they would not be willing to use a telephone contact number when seeking information, as this medium is difficult for them. Instead they prefer face-to-face communication. In

addition the location of the problem to an extent dictated the sources of information employed. Where information was needed about a problem specific to their country of origin, they would use informal sources of information situated there rather than try to source information about the problem in the community in which they were based. Moreover, they would expect their Japanese employers to provide information where the problem was of a general nature, rather than one such as the suspected TB incident, which was specific to the community where they lived.

Again homophily was an important element of the informal sources of information utilised by these participants. Both neighbours and the parents of their children's friends were considered to be very helpful by the respondents. Parents with children of the same age would be contacted where there was a non-medical problem concerning children as "they would know about it" (Tinterview 003).

Buckland (1995) contends that friends and relatives are a popular source of health information as the "barriers to the information are less compared to other sources." In addition, personal experience is also a factor in the importance attributed to the information imparted by friends and relatives.

The data from this telephone interview survey confirms these findings. For individuals whose first language is not English, the reduced barriers to information associated with informal information sources are an important element in their search for information. Personal experience was perhaps more significant for the majority of the interviewees who selected information sources on the basis of this attribute. Non-english language speakers, however, tended to consider, for example, all neighbours as potential information sources rather than selecting specific individuals on the basis of their experience.

With relation to the information dissemination process during the suspected TB incident, these findings suggest that not only were children overlooked as a target audience for the information, but individuals whose first language was not English were also overlooked in the dissemination process.

The findings also suggest that whilst informal information sources were used by all sections of the community, they were particularly important for those individuals whose first language was not English. Buckland (1995) however points out that there are some concerns about the quality and accuracy of information received from friends and relatives. When this information is also communicated through the medium of a second language the potential for inaccuracy must be increased.

6.8 Conclusion

This questionnaire survey of community members sought to determine their perspective of the information dissemination process. In particular, the survey sought to ascertain the views of the respondents in relation to the criteria set for the information dissemination process by the information providers, and to determine whether their assumptions about the community were valid. The questionnaire responses indicated that the newsletters and the meetings did address the concerns of the respondents who received information from these sources. The results also indicated that the information disseminated did reassure the community, thereby preventing the creation of a sense of panic in the community. The information providers, however, did not achieve their goal of maintaining the consistency of the information disseminated across the full range of information sources. Given the range of information sources available to the community and the resultant potential for re-interpretation this finding is not surprising. Indeed, given the portrayal of the media by risk communication researchers as "selective and biased reporters that tend to emphasise drama, conflict, expert disagreements and uncertainties" (Covello, 1989) it is perhaps more surprising that a greater degree of inconsistency was not reported. In relation to the assumptions held by the information providers about their audience the survey responses indicate that the audience was well-educated and literate. It should however, be noted that these results may be biased due to the nature of the survey.

The children's questionnaire responses indicated that although parents were an important source of information about the incident, as the information providers assumed, they were not the only source of information as the media was an equally important source of information for children. Concerns, however, about the consistency of information and the criticisms of media coverage of risks noted above suggest that more effort might have been expended in relation to providing information for children. Information providers assumed that non-attendance meant satisfaction with the information provided. The questionnaire responses, however, show that individuals displayed both information monitoring and information blunting characteristics during the suspected TB incident (Miller & Mangan, 1983). As information blunters are associated with strategies designed to avoid information, and

information monitors may adopt information blunting behaviour as a result of previous information monitoring activity (van Zuuren & Wolfs, 1991) this assumption cannot be upheld. Further research would be required to determine whether in fact non-attendance was in the majority of cases a result of satisfaction with the information provided. This study has, however, highlighted the importance of considering information seeking style when assessing the effectiveness of an information dissemination strategy.

The final phase of this fieldwork, the telephone interviews, highlighted the nature of informal information sources and the importance of homophilous communication, most notably for individuals whose first language was not English.

The telephone interviews also illustrated the importance of the perceived relevance of the information, one of the elements of the model of effective dissemination.

The concluding chapter of this thesis, therefore, considers these findings in relation to the proposed model of effective dissemination, and also any implications for research, education and practice in the field of information studies.

7.1 Introduction

The broad aim of this research project was to characterise and evaluate the dissemination of information to a community during a suspected TB incident. Achievement of this aim would not only contribute to debates in the information studies field about the effective dissemination of information, but also identify implications for research and education in the field.

This chapter will, in the first instance, evaluate the extent to which characterisation and evaluation was achieved in this study, before proceeding to outline the contribution made by the research towards theoretical models of dissemination and the indications for research and education that this suggests.

Characterisation involved reviewing and synthesizing the existing research literature considering the effectiveness of information dissemination strategies. The evaluation of the information dissemination process during the suspected TB incident built upon this synthesis by incorporating the perspectives of the multiple stakeholders involved in the dissemination process. The evaluation was, moreover, conducted at synthesis level, whereby researchers reflect upon "what has been learned from the whole project" (Banwell, 2000).

This chapter, therefore, not only discusses the research findings in relation to the objectives set for the project, but also with respect to the wider research community within which the study is situated. The evaluation considers the migration of the systematic review technique to the field of information studies research, and the employment of the technique in this particular study. The implications of the model of effective information dissemination, produced as a result of the qualitative systematic review undertaken for this project, for both research and practice in the field of information studies, is also described.

7.2 Objectives

7.2.1 Evidence of effectiveness

This research project aimed to characterise and evaluate the dissemination of information to a community during a suspected TB incident. The specific objectives set for the project in this regard were to:

1. Determine the existing evidence of the effectiveness of information dissemination strategies
2. Determine the criteria set for the dissemination of information in the specific context of the suspected TB incident in Ponteland

Determining the existing evidence of the effectiveness of information dissemination strategies entailed a systematic search of the research literature in a variety of fields and disciplines. Reports retrieved by the systematic search were then assessed in relation to pre-specified criteria of relevance. These criteria, related to geographical, technological and methodological aspects of the research (See Section 4.4.2 & 4.4.3), ensured that the focus of the search was upon the retrieval of studies demonstrating the effectiveness of information dissemination strategies. The notions of effectiveness employed in the studies all related to a change in the user, which ranged from changes in knowledge to changes in attitude or behaviour. A dissemination strategy was deemed to be effective by researchers if the anticipated change could be ascribed to the particular information dissemination method being studied.

The systematic review technique employed for this phase of the study originated in medical research, where the nature of evidence is prescribed by disciplinary concepts of methodological relevance. Research designs are categorised in hierarchical levels of evidence, whereby studies are rated according to the research design employed. These hierarchical levels of evidence, however, are firmly grounded in the quantitative research paradigm. The methodological criteria, against which studies in the systematic review conducted for this project were assessed, required that the studies retrieved incorporated a qualitative research element. The nature of the evidence retrieved by the systematic review was, thus, broader in scope and practice than is traditional with the systematic review method.

Assessment of the rigour of the study methodologies was facilitated by the employment of a quality checklist. Although restrictive as an assessment method (Booth, 1998), the checklist was designed to ensure that the findings of the study included in the final analysis had been conducted with due regard to qualitative research practices.

The nature of the evidence constructed from the retrieved studies was, thus deemed to be sufficient to enable reliance upon the findings of the research.

Retrieval of the twenty relevant studies (See Appendix 5) achieved the research project's objective to determine the existing evidence of the effectiveness of information dissemination strategies. Synthesis and analysis of the relevant studies would, it was anticipated, highlight the most effective dissemination strategy for any given situation.

7.2.2 Dissemination criteria

The second objective set for this project was to determine the criteria set for the dissemination of information in the specific context of the suspected TB incident in Ponteland. Determining whether any criteria were set for the dissemination process in Ponteland, and if so what these criteria were, required the collection of data from a variety of individuals. To ensure that the views, of as many as possible, of the individuals involved in the dissemination process were incorporated in the data analysed for this project, a 'snowball' sampling strategy was employed. This strategy, which involves cumulative identification of potential respondents by existing participants, enables the inclusion of a wide variety of perspectives in the subsequent data collection and analysis. The variety of perspectives incorporated in this research encompassed three main types of information provider in the community:

1. Health professionals
2. Education officials
3. Local government officials and other information providers

The incorporation of these various perspectives also represented a triangulation of sources, thus, "checking out the consistency of different data sources within the same method" (Patton, 1990). Triangulation of sources enhances the credibility of the research findings as criteria identified in the data analysis are corroborated across the accounts. Analysis of the interview data identified three criteria set for the dissemination process by the information providers:

1. To stop the creation of panic in the community
2. To maintain consistency in the information dissemination process
3. To validate the concerns of the community

The collection and analysis of the interview data, thus, enabled the achievement of the second objective set for this research. Data analysis, however, also highlighted issues, regarding the information dissemination process relating to other stakeholders in the process, the information recipients that required exploration and clarification.

7.2.3 A cross-disciplinary research method

A third objective was set for this research project in relation to the research process itself. This objective was to:

3. Identify and develop research methods, which reflect the cross-disciplinary nature of the topic

The systematic review technique, as noted above, is traditionally associated with quantitative medical research. As this research project considers a medical topic, the suspected TB outbreak, from the information studies perspective the technique was identified as a potentially relevant research method reflecting both the main aspects of this research project. The technique did, however, require some adaptation to ensure that, whilst the essential nature of the technique remained, the deployment of the method was consistent with research practice in the information studies field. Elements of the original technique which were considered inappropriate, in the context of interpretive research in the multi-disciplinary field of information studies, were:

1. The employment of hierarchies of evidence as an aid to the assessment of the rigour of research
2. Statistical synthesis and analysis of research results

A feasibility study, conducted by the Health Libraries Group (Booth, 1998), to determine the appropriateness of the systematic review technique in information studies research, found that, whilst there was "undoubted value to information practitioners from the production of systematic reviews, the most practical approach was to seek the best available data, rather than only the highest quality studies." This statement concurs with the assertion made previously, that applying hierarchies of

evidence is inappropriate for the information studies field, where the nature of the research available is, perhaps not as easily categorised, than is perhaps the case in the medical research field.

The review conducted for this project sought to include research studies incorporating a user perspective. Levels of evidence derived from the quantitative research paradigm are, therefore, inappropriate to apply in this context. This aspect of the systematic review process is also part of a wider debate in the research community concerning the assessment of rigour in qualitative research (See Section 3.7). Stances taken in this debate, range from viewing the assessment of qualitative research as "antithetical to the nature of this research" (Denzin & Lincoln, 1998), to acknowledging "the need for mechanisms to guard the integrity of the research process" (Glazier, 1992). This researcher concurs with the latter view. Whilst a hierarchy of evidence is considered an inappropriate mechanism to employ in the assessment of qualitative research in a systematic review, agreement with Glazier's statement does, however, imply that some mechanism for assessing the quality of research studies should be employed.

The relevant studies retrieved by the systematic review conducted for this project were, therefore, assessed in relation to a checklist compiled for this study, but adapted from existing work in the field (See Appendix 6). No one study design was accorded greater significance in this assessment as it was acknowledged that the most appropriate research design in any study depends upon the specific research questions posed (Blaxter, Hughes & Tight, 1996). Thus the assessment of the retrieved studies aimed to determine whether the research reported in each study was credible i.e. did "the findings of the study make sense?" (Miles & Huberman, 1994).

The checklist itself was an aspect of the development and adaptation of the systematic review technique from the medical research domain to the information studies field. The checklist, thus, represented an attempt to retain the essence of systematic reviews i.e. to be systematic and reproducible, whilst still reflecting the nature of interpretive information studies research. This checklist approach to the assessment of research quality was also designed to accommodate the objective nature of systematic reviews. It is, however, acknowledged that, despite the use of this device, an assessment of the quality of an interpretive study may not always be completely objective. Researchers may hold differing views, for example, on the suitability of particular research methods for specific research questions. It was noted previously (See Section 3.1) that

research project methodologies might be determined by "disciplinary prescriptions, concerns about scientific status, old methodological habits and comfort with what the researcher knows best" (Patton, 1990). The assessment of research projects will, thus, naturally be subject to the same concerns.

The systematic review process does, however, incorporate a strategy designed to enhance the credibility of review findings, analyst triangulation, which uses "multiple analysts to review findings" (Patton, 1990). In this particular review the 'multiple analysts' were individuals who were involved in the supervision of the doctoral research process and/or possessed expertise in the area of health information provision. These individuals independent assessment of the rigour of the review studies, using the checklist constructed for the review, confirmed that the research was of sufficient merit to allow reliance upon the accounts. The 'multiple analysts' did, however, express concerns about employing a checklist to assess the auditability and credibility of research reports. In particular, concern was expressed that whilst a checklist may be an adequate technique for assessing the conduct of a research project, it did not adequately address the interpretive element of qualitative research. This aspect of the development and adaptation of the systematic review technique was explored further, as an element of the approach adopted to synthesis and analysis of the review data in this study.

7.2.4 Synthesis and analysis

The statistical synthesis and analysis of research results, as practiced in medical research, is the second element of the technique considered inappropriate for systematic reviews of interpretive research. Adapting the review technique to accommodate qualitative research studies in this respect was, therefore, another aspect of the objective to develop research methods reflecting the cross-disciplinary nature of the topic. Synthesis and analysis of the research results in the systematic review conducted for this study was achieved by the employment of a meta-ethnographic approach (See Section 4.9). As with the checklist above, this approach reflected the systematic and reproducible nature of systematic reviews, whilst still retaining the interpretive nature of qualitative research. Meta-ethnography involves extracting key metaphors from research accounts, then comparing and translating these metaphors to produce terms that can be applied across the studies (Noblit & Hare, 1988).

In the first instance the meta-ethnographic approach was expected to identify the key elements of an effective information dissemination strategy. The first level of synthesis did, in fact achieve this objective by identifying a list of the factors involved in effective information dissemination (See Section 4.10.3). The meta-ethnographic approach to data synthesis and analysis, however, enables a further level of synthesis to be achieved, whereby the pattern behind the key elements may be determined. Meta-ethnography thus answers, in the first level of synthesis, the question, what are the elements of an effective information dissemination strategy, and in the second level, why are these elements important for effective dissemination?
In this specific review, the second level of synthesis resulted in a model of effective information dissemination, incorporating the factors identified in the first level of synthesis.
It is apparent from the above that the employment of the systematic review technique in this research project did achieve the research objective, to identify and develop research methods reflecting the cross-disciplinary nature of the research topic. The adaptation of the systematic review technique incorporating the meta-ethnographic approach to data synthesis and analysis, moreover, produced a model of effective information dissemination that provided a framework for the evaluation of the information dissemination process during the suspected TB incident.

7.3 Characterisation of effective information dissemination

7.3.1 A model of effective information dissemination

One of the broad aims of this project was to characterise the dissemination of information during the suspected TB outbreak. Characterising the dissemination of information, in this instance, was intended to enable the construction of a definition of effective information dissemination, derived from the synthesis of research findings in a systematic review of the research literature. The meta-ethnographical synthesis and analysis of the systematic review data produced a model of effective information dissemination, rather than a definition of effective information dissemination. This model (See Figure 8) illustrated the inter-dependant nature of the factors identified in the information dissemination process, whereby no specific element could be identified that would, in itself, ensure effective information dissemination. Instead,

effective information dissemination relies upon the combination of factors in the model. Characterising the dissemination of information to the community during the crisis, thus, entails applying this model of effective information dissemination in general to the specific circumstances of the crisis experienced in Ponteland.

7.3.2 Applying the model of effective information dissemination

The model of effective information dissemination constructed in this study highlights the roles of information provider and information recipient, and the factors that link these roles in the dissemination process. In this, the model differs from the traditional 'cascade' model of information dissemination, which is top-down rather than integrative and holistic. The linking factors in the model were:

1. Targeting information to the specific audience
2. The role of opinion leaders
3. The recipient's willingness to accept new knowledge

The concepts of targeting information to the specific audience and the role of opinion leaders were explored in the interviews conducted with information providers, whilst the role of opinion leaders and the recipient's willingness to accept new knowledge, were explored in the questionnaire survey and interviews with community members. In this project, the individual's willingness to accept new knowledge was considered to be a facet of their information behaviour. Brashers, Goldsmith and Hsieh's (2002) review, for example, proposed information avoidance as a strategy for individuals who were not willing to accept new knowledge. Dervin's sense-making approach (1992), moreover, suggests that information seeking is an activity linked to the individual's willingness to accept new knowledge to bridge "the gaps in their current knowledge."

This project does not seek to determine the characteristics or specifically identify opinion leaders in the community during the suspected TB incident. Rather, the research sought to explore the concept of opinion leaders and their relevance to an effective information dissemination process, with consideration of the specific circumstances experienced during the crisis.

7.3.3 Targeting information

The dissemination process during the crisis followed a classical, centralized diffusion system model, whereby information is "diffused as a uniform package" (Freimuth, 1987). Adoption of this model suggests that targeting information to the requirements of the various audiences in the community was less likely to occur in this instance, than would be the case with a less hierarchical diffusion model.

The interviews conducted with key informants in this study explored the concept of targeting information, in the specific context of the information dissemination process during the suspected TB incident. The potential audiences for the information disseminated during the incident were many and varied. The community involved in the incident included such diverse groups as school-age children, elderly residents and individuals whose first language was not English. Providing information to such diverse groups presents a challenge for any information provider, providing information to these diverse groups during a crisis would be particularly challenging. The interviews, therefore, attempted to discern, and clarify if necessary, the extent to which measures were taken by information providers to cater to these diverse audiences.

School-age children were at the heart of the crisis in the community. As well as being the focus of the TB screening process, the children were also the main delivery mechanism for information, at least in the initial stages of the crisis. Interviewees were, therefore, asked to describe any measures taken by them to provide information about the crisis specifically to children.

The information providers did acknowledge that children were a potential audience in the dissemination process. In the majority of cases, however, no specific measures were taken to target information for this particular audience. Where measures were taken, these tended to be part of the strategy adopted by education officials, typically announcements in school assemblies, and were most likely to occur during the early stages of the crisis, rather than the latter stages. Information providers justified these actions with their assumption that children would receive information from their parents during the crisis. As the responses to the children's questionnaire, however, illustrates (Figure 18) children were just as likely to be informed by the media coverage of the crisis, as to be informed by receiving information directly from their parents.

This finding suggests that targeting information specifically for a child audience should have been considered in the overall information dissemination strategy. The media are, not only, a key source of health information for consumers (Stevens, Morris & Rolinson 1996, Merry 1997, Mackay 2000), but also play " a rather significant role in public perceptions of risk" (Einsidel, 1989). This study suggests that these roles are particularly evident in relation to child audiences. There are, however, some concerns about the quality and accuracy of health information provided by this medium (Smith, C 1997, Neuberger 1999, Logan 1991). With the benefit of hindsight, one information provider did acknowledge, that "we should have thought harder about the children" (Interview 009).

At the opposite end of the age spectrum, elderly residents might also have been considered a potential target audience for information during the crisis. The initial delivery mechanism employed by information providers, to distribute newsletters via children attending the local schools, would potentially only reach elderly residents in the community in a very few instances. Indeed, the majority of respondents in the upper two age groups of the questionnaire survey first became aware of the crisis through media coverage. The respondents in these age groups either lived in close proximity to one school involved in the incident, or to the swimming pool ultimately identified as the probable source of the unspecified mycobacterium responsible for the abnormal test results, and were thus expected to have had a high perception of being at risk.

Although the initial delivery mechanism for the newsletters, via the local schools, was later modified in response to demand from the community, no other measures were specifically employed to target information to this audience.

In this study, the respondents identified as possible information blunters were all aged 56 years or over. Analysis of the comments recorded by these individuals, at the end of the questionnaire survey, revealed that they did not consider information concerning the suspected TB outbreak to be relevant to their particular situation, despite their close proximity to two of the sites particularly involved in the incident. This finding suggests that elderly residents in the community were not an appropriate target audience for the information dissemination process, due to the perceived irrelevance of the information. No specific measures were, thus, required to ensure that information reached these individuals.

One group within the community, however, who did require specific measures were those individuals for whom English was their second language. For this group, neither formal written communication, requiring a high level of literacy in English, nor telephone support, requiring reasonably high levels of verbal communication skills in English, were appropriate methods of information dissemination. For this group, in particular, informal interpersonal sources of information were preferred. However, information relayed by these means is subject to re-interpretation, and as a result there are concerns regarding the quality and accuracy of information thus disseminated (Buckland, 1995).

It is apparent from the above that targeting information to the specific audience *is* a key element in the effectiveness of an information dissemination strategy. To target information effectively, however, requires a considerable amount of knowledge about the intended audience. In an ideal world every dissemination effort would be tailored to a precisely defined target audience. In reality, and particularly in crisis situations, this is rarely achievable. The importance of attempting to define the target audience should not, however, be underestimated. At the very least, information providers must guard against making erroneous assumptions about their target audience, as this could create barriers between themselves and the intended recipients of the information. In the examples shown above, an assumption that all individuals requiring further information were in a position to use the contact telephone number provided created an unnecessary barrier between the information provider and the intended information recipient, whose first language was not English.

Every dissemination effort sets out to inform a specific audience, and it is in both the information provider's and the information recipient's interests to ensure that the strategy adopted is appropriate to that specific audience.

7.3.4 The role of opinion leaders

The interviews conducted with key informants in this study also explored the concept of opinion leaders as a factor of an effective information dissemination effort. Diffusion research suggests that the role of opinion leaders is to persuade rather than to inform (See Section 2.3.4), whilst social cognitive theory contends that the importance of opinion leaders is in their "modelling" of appropriate behaviour (Bandura, 1986).

'Modelled behaviour' was demonstrated in this study. Health officials, for example, informed the community, that they too were personally affected by the abnormal test results. The 'modelled behaviour' was to adhere to the medication programme, despite the increasing uncertainty over the initial diagnosis of a suspected TB infection. Information providers identified health officials as potential opinion leaders during public meetings. All, bar one, of the questionnaire survey respondents, who indicated that they attended public meetings, agreed that it was reassuring to know that some of the health professionals were personally involved. These respondents also agreed that it was important to them to hear the information directly from the people involved.

Kasperson (1992) noted that "individuals do not act merely in their roles as private persons, but rather according to the role specification accorded to their positions." Thus health officials informing the community of their personal involvement in the crisis, were acting in both a personal and a professional capacity. The community members attending the meetings would have received this information with due regard to both of these roles.

It was suggested previously, that individuals employed as health officials would be expected to attenuate the risks associated with the possible spread of TB infection when transmitting information (See Section 2.3.4). Individuals, in this instance, who were cast in the role of opinion leaders thus modelled behaviour that was appropriate to this stance, in this instance, compliance with the medication programme. Respondents, who attended the public meetings, also agreed that they felt satisfied after the meetings that everything possible was being done to protect the community. Attendance at a meeting signified a desire for more information than had previously been given in the newsletters. The questionnaire responses indicate that opinion leaders, therefore, did persuade the respondents to accept the information, of which they had previously been informed in the newsletters. A key informant, employed in the Health Service, stated that a figure of 95% compliance with the medication programme was achieved (Interview 014).

7.3.5 Homophilous communication

An important aspect of the role of opinion leaders in the dissemination of information is the concept of homophilous communication (See Section 2.2.4). This concept

suggests that communication between individuals sharing similar attributes, for example, social status, values and beliefs, is more effective than that between heterophilous individuals, whose status, values and beliefs are dissimilar. Communication between opinion leaders, who were high status health professionals, and a "university educated, articulate audience" (Interview 009) would, it is suggested, be more effective than communication between the same health professionals and individuals who, for a variety of reasons, did not share the same status, values or beliefs. Indeed, one interviewee talked about meetings with parents in other incidents being "aggressive and threatening," because the individuals attending the meetings were "distrustful of authority, and had what you could call collective acrimony" (Interview 002).

The heterophilous nature of communication between the health professionals and individuals who did not share the same status, values or beliefs , therefore, also suggests that these individuals might have identified other individuals to fulfil the role of opinion leaders. The respondents in this study, whose first language was not English identified a number of potential opinion leaders in the community. These opinion leaders were proposed on the basis of their shared status and attributes in relation to the respondent and the situation with which they are faced. Thus, the parents of a child's friend would be sought out as an opinion leader when the situation for which information was sought related specifically to the child. Information on a more general level, however, would be sought from neighbours if the problem was local, or from official company sources, if the problem was general in nature. Communication between the children involved in the crisis and the formal information providers was especially heterophilous. Sixteen child respondents indicated that they found out what was happening in Ponteland from teachers, but when asked to indicate which was the most important source of information, no respondents identified teachers in this category. Although nineteen child respondents indicated that they found out what was happening in Ponteland from their friends, again no respondents identified friends as the most important source of information. These findings indicate that whilst opinion leaders are an important element of an effective dissemination strategy, consideration should also be given to the degree of homophily between the information providers and the information recipients. The findings, moreover, suggest that an important aspect of homophilous communication is the degree to which the potential opinion leader has previous experience of the

situation, a factor previously noted in relation to consumer health information provision, where personal experience has an impact upon the importance attributed to the information provided from this source (Buckland, 1995).

7.3.6 Willingness to accept new knowledge

The third linking factor in the model of effective information dissemination explored in relation to the crisis experienced in Ponteland, was the concept of the information recipient's willingness to accept new knowledge. The particular aspect of this concept explored, in both the questionnaire survey and the subsequent telephone interviews, was the impact of the individual's information seeking style upon the effectiveness of the information dissemination process.

Analysis of the key informant interview data identified an assumption, on the part of the information providers, that not seeking information was an indication that recipients' were satisfied with the information provided. Miller and Mangan's (1983) and van Zuuren and Wolf's (1991) research has already demonstrated that individuals may adopt an information blunting strategy towards a crisis, thereby choosing not to actively seek information. This does not however suggest that individuals adopting this information behaviour strategy are necessarily satisfied with the information they have already received. Indeed, the opposite may be true. Brashers, Goldsmith and Hsieh (2002), for example, contend that an individual may adopt an information blunting strategy when there is a possibility that new information will conflict with their existing health beliefs. Thus an individual who believed that the source of the suspected TB infection was environmental might not actively seek information in case it refuted this view.

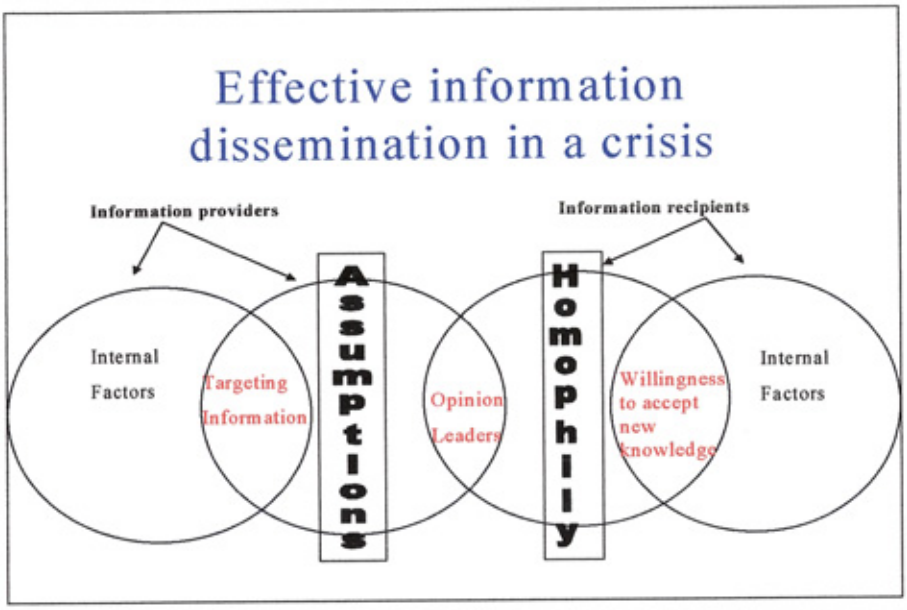
Analysis of the questionnaire data suggested that the respondents to the survey included both information monitors and information blunters. It should be noted, however, that non-response to the survey may well have been part of an information blunting strategy adopted by some of the recipients of the questionnaires.

The questionnaire data did, however, indicate that information seeking style was an important aspect of an effective information dissemination strategy. Information monitors, for example, utilised a wide variety of sources, all of which were considered to be important.

The perceived relevance of the information was, on the other hand, an important consideration for information blunters. In this study, however, the individual's identified as possible information blunters, were all elderly residents, a group to whom the crisis had the least relevance. Thus, to construct a possible model of an information blunter from the responses received to this study, would be potentially flawed by the lack of responses from possible information blunters belonging to other groups in the community.

7.3.7 Effective information dissemination in a crisis

The application of the model of effective information dissemination to the crisis experienced in Ponteland highlights that the three linking factors are relevant in this situation. Exploration of these elements of the model, in the key informant interviews and the questionnaire survey, however also highlights two further elements that should be incorporated in the model of effective information dissemination when applied to a crisis situation. The two elements previously missing from the model, are the notion of homophilous communication and the barriers created by information providers' assumptions about the audience. The resulting model of effective information dissemination in a crisis is shown below (Figure 23).



(Figure 23)

Both of these factors are represented as barriers to effective information dissemination in the model above. Erroneous assumptions about the target audience, for example, can result in information failing to reach the intended audience. In this study, where the assumption that parents passed information on to their children was unfounded, children involved in the incident may not have received any specific information about the crisis. As the children, particularly those who recorded positive test results, will be under medical surveillance for a number of years, a complete lack of information about the situation on the part of a child could have an impact in the future.

Effective heterophilous communication, moreover, is difficult to achieve. For certain groups within the community, however, children or non-English language speakers for example, this was the only type of formal communication available to them during the crisis. The potential for misunderstanding in this type of communication is greater than in communication between similar individuals. The expanded model, therefore, suggests that information providers should attempt as far as possible to incorporate homophilous communication in the dissemination strategy.

In the suspected TB incident, the information providers did consider inviting local children to produce a magazine about the crisis. Adoption of this strategy would have provided children in the community with a means of achieving homophilous communication. The strategy was not adopted, however, due to resistance from some quarters and the time lapse between the crisis and the suggested magazine production.

7.4 Reflection upon the research

7.4.1 Research methodology

This research sought to evaluate "what has been learned from the whole project" (Banwell, 2000). The evaluation, therefore, extends beyond the consideration of the research findings in relation to the aims and objectives set, to reflect upon the research methodology.

This research project identified the systematic review technique as appropriate for the study. The systematic review technique is already the subject of discussion in the field of information studies (Booth 1998, Booth & Haines 1998). This project, however, in employing a meta-ethnographic approach to synthesis and analysis represents a

further development of the technique in the information studies field. In addition, the successful conclusion of the review demonstrates, both the feasibility of the meta-ethnographic approach in a qualitative systematic review, and the applicability of the systematic review technique to information studies research. This research also illustrated, in the production of the model of effective information dissemination, that the highest level of synthesis and analysis is achievable by this method.

There are some concerns remaining, with respect to the assessment of the rigour of research in a qualitative systematic review. Although part of a wider debate in the qualitative research community (See Section 3.7.1), the assessment of research rigour is particularly relevant to the employment of the systematic review technique. Collating the results of a number of studies, to produce a composite picture of the research area, requires some consideration of the rigour of the original studies. Where the original studies are methodologically weak, the resulting composite picture will be fundamentally flawed, and, thus, unreliable.

The checklist employed in this study represents one approach to the problem. The checklist does not thoroughly address the interpretive nature of qualitative research in its' assessment of rigour. The meta-ethnographic approach, however, does acknowledge the epistemological foundations of review studies in the highest level of synthesis and analysis. At this level, determining the pattern behind the review studies in this research involved consideration of the theoretical foundations of each study. Identification of the theories underpinning the review studies highlighted the relationship between the theoretical and practical aspects of the research. The strength of these relationships was evident, not only in the identification of the common theoretical foundations, but also in the level of integration between these foundations. Utilising the checklist and the meta-ethnographic synthesis and analysis allows assessment of the rigour of interpretive research on two levels. Thus, the original assessments of the conduct of the research from application of the checklist, are confirmed, or refuted by the identification of the theoretical foundations of the research.

7.4.2 Information blunting

As well as reflecting upon the qualitative systematic review method employed in the study, this evaluation highlights another lesson that can be learned from this study.

Van Zuuren & Wolf (1991) experienced difficulty in determining the attributes of information blunters. In this research, also, the identification of information blunters was not as clear as that of information monitors. The research did, however, highlight that the perceived relevance of the information was possibly a factor in the adoption of an information blunting style.

The attendance at the public meetings held during the incident illustrates the importance of relevance to the audience. The meetings held at the height of the crisis were the best attended. At this time, the cause of the crisis was unknown and the possibility of children developing TB infections could not be ruled out. The final meeting, which failed to attract a single member of the community, was held when it was apparent that it was highly unlikely that the children had been in contact with TB. The relevance of the information that might have been available at this final meeting was, therefore, not sufficient to encourage information monitoring behaviour.

Whilst this research identifies the perceived relevance of the information provided to be a factor in the adoption of an information blunting style, the data collected was insufficient to provide any further insights into the nature of information blunting. The research does, however, illustrate that effective information dissemination requires a detailed understanding of the environment in which the particular information provision occurs.

The importance of considering information seeking style, as evidenced by the findings of this project in relation to the model of effective information dissemination, should not be underestimated. Indeed, the strategy of looking for negative cases to enhance the credibility of qualitative research (Patton, 1990), suggests that consideration of information blunters is a requisite, rather than a desirable, aspect of information studies research.

This research has illustrated that the perceived relevance of information is a factor in the adoption of an information blunting style. In conjunction with the aspect of targeting information to a specific audience, applying both factors to the consideration of information dissemination in a specific context may enable further insights to be gained in relation to information blunting.

The synthesis level of evaluation encourages consideration of the research process as well as the research findings. The evaluation of this research, thus, highlights not only the concerns held with respect to the assessment of rigour in qualitative systematic

review studies, but also the appropriateness of the measures taken to address these concerns.

In addition the evaluation highlights that the research findings were unable to present a comprehensive description of an information blunter, although data analysis supported the suggested importance of one factor in the model of effective information dissemination, relevance, for information blunters in particular.

7.4.3 Diffusion research in information studies

The literature review conducted for this project highlighted the relevance of two particular areas of research to this study. It was, thus, stated that this project would borrow from the areas of diffusion research and risk communication.

Of the twenty studies considered relevant in the qualitative systematic review all but two were conducted in the area of health information. Outside of this field very little research has been conducted in information studies that addresses the diffusion of information. This situation exists, moreover, despite Chatman's study in 1986 demonstrating the feasibility of this line of enquiry in information studies research.

The concept of diffusion, by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995), is equally applicable to the communication of information. Consideration of the spread of information as a form of diffusion highlights the need to consider the role of opinion leaders in the process, as well as considering the nature of the networks through which the information is spread.

Widening the focus of information studies research to include diffusion research, with its innovation – adoption perspective, may also provide an alternative route to information blunters. Diffusion research identifies the characteristics of innovation adopters in relation to their place in the adoption distribution curve (Rogers, 1995). Innovation adopters are, thus, identified as early adopters or late adopters. In the Ryan and Gross study (1943) early adopters of the innovative seed corn were most influenced to adopt by salesmen, whilst late adopters of the corn were most influenced by their neighbours. Translating this aspect of diffusion research to the information studies field may lead to the identification of similarly influential sources for information monitors and blunters.

The second area from which this project borrowed was the field of risk communication research. The traditional view of risk communication as a highly quantitative, technical model of communication is no longer wholly applicable to this field. The variety of risk communication perspectives now prevalent in the field (See 2.3.2.2) suggest a widening of this focus, from a technical risk assessment, expert to lay person, communication model to an emancipatory, collaborative joint assessment of risk involving communication and feedback with all interested parties. Information studies research with its traditional focus upon the information user, and its multi-disciplinary focus can incorporate the wider perspective now apparent in risk communication. Consumer health information provision and risk communication are closely related. Acknowledging this close relationship in research studies such as this one, should ensure that the two areas develop along similar lines, profiting from new insights in each, rather than developing along parallel lines and re-inventing the wheel unnecessarily.

7.4.4 The researcher's role

7.4.4.1 Reflective practice

As well as reflecting upon the methodology employed in this project, it is also important to reflect upon the researcher's role in the study. Qualitative research projects employ methods, such as participant observation and interviews, which rely upon the researcher as the instrument of data collection (Maykut & Morehouse, 1994). In addition, the interpretive nature of qualitative data analysis places further emphasis upon the researcher's role in the process. Qualitative researchers have adopted strategies, such as triangulation and member validation, to temper this dependence upon the researcher's perspective. Denscombe (1998) points out, however, "the role of self in qualitative research is important." Greene (1998) moreover contends that "it is precisely the individual qualities of the human inquirer that are valued as indispensable to meaning construction."
Action research, a specific research strategy within qualitative research whereby "practitioners are the crucial people in the research process" (Denscombe, 1998), encourages practitioner researchers to reflect upon their role and "improve [their] action and professional practice" (Hinnett, 2002) in the light of their research

findings. Research in this field has considered the process of reflective practice in sports coaching (Knowles et al., 2001), the use of a reflective diary in a PhD study (Glaze, 20020, and the strengths and weaknesses of reflection in nursing and education (Hannigan, 2001).

The researcher in this study is not currently a practitioner in health information dissemination, so this study cannot be considered to be action research. The reflection undertaken in this study is still, however, intended to highlight the lessons learned from the study thereby improving the researcher's practice in subsequent projects. Moreover, the reflection on practice discussed here is also conducted to ensure that any potential bias in the research process has been acknowledged. May (1993) contends that "the researcher and those people in the research carry with them a history, a sense of themselves and the importance of their experiences." The purpose of this reflection is, therefore, to examine the extent to which the shared history and experiences of the researcher and the research participants in this study might have impacted upon the research process and findings.

At the beginning of this thesis (See Section 1.2.1) it was noted that the involvement of the researcher's family in the suspected TB incident was a major factor in the decision to initiate this research project. Whilst this involvement was an initial motivator for the selection of the case to be studied, this history and experience also meant that the researcher brought a number of other roles, e.g. parent, resident, friend and colleague to the research. The extent, if any, to which these roles had a bearing upon the process and findings of the research is therefore considered here.

7.4.4.2 'Insider' status and data access

Denscombe (1998) contends that "insider knowledge can be a genuine bonus for research, however, it can also pose problems." The extent to which this status can be monitored, or detected, "are [however] issues of little consensus within the qualitative evaluation community" (Greene, 1998). In this study, the researcher's history as a participant in the suspected TB incident carried with it both advantages and disadvantages for the research, most particularly in the following areas:

1. data access
2. participant responses
3. interpretation of the data

With regard to data access, documents produced for the community during the suspected TB incident were available from the researcher's own collection, or from a more extensive collection of documents loaned to the researcher by a close acquaintance. As a result, requests for documentation from key informants were minimal, and related overwhelmingly to information published for internal audiences rather than for the community in general. In addition, the receipt of the document collection during the initial stages of the research ensured that the analysis of the interview data was conducted from the beginning of the fieldwork with access to the relevant documentary evidence.

The role of gatekeepers in relation to accessing potential informants was discussed in the previous chapter (See Section 6.4.3), where it was noted that researchers who "have already established some form of identity in the eyes of the gatekeepers can capitalize on this when negotiating access" (Foster, 1996). In this study, the researcher's identity as a colleague, friend, parent or resident was well established with a number of the prospective research participants. Moreover, the opportunity to exploit these existing relationships was negotiated and readily agreed by both parties at the outset. Bowler (1997) attempted a similar strategy in her research, recording that "she 'got in' to the group of South Asian women living in the city through becoming a volunteer teacher in the community." Whilst this action successfully established Bowler's identity with her prospective informants, Bowler was, however, unable to exploit the relationship to gain access to potential informants as the relationship was not sufficiently robust to overcome cultural reservations about interviewing. In the suspected TB incident study, the researcher and the majority of the research participants shared a common cultural background, facilitating homophilous communication between the researcher and the participants, and the difficulties Bowler noted were not experienced. Although the researcher and the non-English speaking participants in the interview survey did not share this common cultural background, a mutually respectful relationship of several years standing had already been established. One of the problems, perhaps, in Bowler's research was the limited length of time that her identity was established before the prospective informants were asked to accept Bowler's new role. In this study the research participants shared various histories with the researcher that were in most instances of several years standing. These participants were aware of the study before any requests

for information were made and had, therefore, already accepted the new role of researcher prior to requests for their specific involvement in the study.
Other aspects of the researcher's identity also contributed to the positive impression of the research when, for example, a shared history of postgraduate research led one key informant to monitor the progress of the research even after the fieldwork was completed. This particular informant was instrumental in identifying other potential key informants in the early stages of the fieldwork, and also in facilitating access to potential questionnaire respondents.

7.4.4.3 'Insider' status and participant responses

The researcher's identity as a parent and member of the community contributed to the number of the positive responses received to interview requests. Potential interviewees in the telephone interview survey, for example, voluntarily contacted the researcher to confirm their willingness to be interviewed in response to recorded message requests.
The impact of the researcher's identity was not, however, solely confined to the interview phase of the research. A number of the questionnaire recipients shared a joint history with the researcher. Some of the child respondents, for example, already knew the researcher as the parent of children involved in the suspected TB incident. For these respondents this shared history proved especially valuable in helping to establish the credibility and trustworthiness of the research.
The shared history with prospective respondents could, however, account for some of the non-responses in the questionnaire survey, where respondents may have felt that their privacy could be compromised. Although the questionnaire responses were deliberately kept anonymous, prospective respondents may have chosen to opt out of the survey rather than risk any possible identification from the sociodemographic information requested. Respondents sharing a history with the researcher, who completed the questionnaire may also have "attempted to answer questions in agreement with their perception of the [researcher's] opinion" (Williams, 1968). More recently Okamota et al. (2002) found that an "interviewer-administered questionnaire showed systematically more desirable responses to questions related to lifestyle factors" than did the same questionnaire when it was self-administered. The anonymity and self-administration of the questionnaire responses were, therefore, a

deliberate strategy in this project to reduce the impact of the researcher's 'insider' status and increase the objectivity of the responses received.

One of the most common problems, however, not only for this specific project but also for qualitative research projects in general, is the extent to which researchers with their 'insider' status might make "prejudgements about typical responses" (Ackroyd & Hughes, 1992). Researchers may, for example, frame their questions around their own assumptions (Silverman, 1997). Dickinson, Connell and Savage (1997) suggest "passing draft materials to 'critical friends' as a useful corrective to the inevitable subjectivism of this kind of study." In this project interview schedules, pilot interviews and questionnaires, and feedback from research supervisors ('critical friends') were all employed in an attempt to minimise the potential for bias arising from this aspect of the researcher's status. Anderson and Olsen (2002) however, found "little evidence to suggest that interviewers' personal habits or attitudes ... had consequences for the responses they obtained." The researchers did, however, also conclude that "thorough training and continuous supervision [of interviewers] may have contributed to this finding." The suspected TB incident research was conducted by a novice researcher, albeit under supervision, and it is therefore acknowledged that some degree of prejudgement may have occurred. Indeed, one question in the questionnaire survey relating to the public meetings included a statement referring to meetings held at two venues, the village hall and a Middle School. In fact an open meeting was also held in a first school in the area to which the researcher had no connection. Respondents who attended this meeting annotated their completed questionnaires to indicate this. It is, however, suggested that as this question formed a small part of the overall questionnaire survey the impact of this prejudgement on the researcher's part was not substantial.

7.4.4.4 'Insider' status and interpretation of the data

Researchers who have particular prior knowledge of the case under scrutiny may fail to identify particular aspects of the situation, which a more 'detached' researcher would perhaps note. On the other hand, "the more familiar that researchers are with the language of a social setting, the more accurate will be their interpretations of that setting" (May, 1993). In this particular study, the prior knowledge of the researcher was limited to the public aspects of the dissemination effort and thus did not include

knowledge about decisions made prior to the dissemination of information. Moreover, the researcher's background in information studies cast her in the role of connoisseur, or expert, in information dissemination thereby "collecting information and using her expert frames and insights to integrate, interpret and judge" (Greene, 1998). The key informant interviews were conducted with individuals who possessed amongst them expertise in a number of fields, including medicine, education, environmental health and leisure management. None of these individuals, however, possessed particular expertise in information provision and dissemination. Thus, the interviews explored issues relating to the information dissemination that had not, in many instances, been previously considered by the informants in relation to the suspected TB incident. In such cases the interviewees themselves used the interviews to reflect upon this aspect of the incident, thereby providing a more considered response than might otherwise have been the case. Thus it is considered that whilst there would certainly have been aspects of the suspected TB incident that the researcher may have failed to identify, the expert status conferred by the researcher's history ensured that the particular aspects relating to information dissemination were acknowledged in the data collection and analysis.

Dickinson, Connell and Savage (1997) also suggest that researchers who enjoy 'insider' status should mentally *step back* during fieldwork. Notes of meetings, experiences, etc recorded by the researcher throughout this study, highlight that the 'insider' aspects of the research became increasingly less apparent as the research progressed. This 'stepping back' from the prior involvement in the suspected TB incident during the interview and questionnaire stages of the fieldwork is primarily due to the process of the qualitative systematic review of the research literature previously conducted. The review process is intended to be objective, systematic and reproducible (Booth, 1999) and, therefore less amenable to personal interpretation than a general review of the literature. The original model (See Figure 8) in this review was constructed from the synthesis and analysis of twenty studies conducted by a number of researchers working in a variety of situations. The meta-ethnographic approach taken to synthesis and analysis of the review studies necessitated consideration of the wider concerns of the theories underpinning the dissemination efforts, thereby distancing the focus of the enquiry from the personal aspects of the suspected TB incident. The review conducted for this study highlighted the elements of effective information dissemination that became the focus of the enquiry during the

key informant interviews and questionnaire survey. Interview schedules, questionnaire design and data analysis were thus informed by the qualitative systematic review findings rather than by the prior involvement in the incident. The process of qualitative systematic review, thus, encouraged adoption of an objective rather than subjective perspective. The fieldwork conducted in the community was founded upon this objective perspective. Whilst the very nature of the research process during the fieldwork included the elements of subjectivity already noted, the application of the model and the development of the enhanced model reinforced the objective rather than subjective nature of the study.

Whilst personal involvement in the incident was a primary factor in the formation of the research proposal, Woolcott's (1990) advice quoted in May (1993) to "maintain a focus on the topic and continually ask the question, what is this [really] a study of?" was particularly salient for this study. In addition, particularly in the key informant interviews with health and local government officials, the researcher's background in information studies rather than medical science, mitigated any potential effect from the history of prior involvement in the incident.

It is apparent from the above that whilst the researcher's 'insider' status did have an impact upon the research process and findings, this was both beneficial and detrimental to the study. It is, therefore, proposed that on balance the shared history of the researcher and the research participants had no biasing effect upon the study or the research findings.

7.5 Implications of this research

7.5.1 The model of effective information dissemination in a crisis

This research project resulted in the production of a model of effective information dissemination in a crisis situation. This model was derived from the findings of a qualitative systematic review that highlighted the key elements of effective information dissemination. These findings, moreover, illustrated that, unlike traditional 'cascade' models of diffusion, the elements of this model should be considered holistically, although, the final synthesis of the systematic review studies did highlight the roles of three elements, linking the information providers and information recipients in the dissemination process.

Application of the model in the evaluation of information dissemination to a community in crisis resulted in the identification of two further elements impacting upon effective information dissemination.

The two elements identified were the assumptions about the audience held by the information provider and the importance of homophilous communication to the information recipient. These elements are portrayed in the model as potential barriers to effective communication.

The model constructed from the findings of this research project conceptualise effective information dissemination as a process involving both the information provider and the information recipient. In this the model contrasts with the traditional expert-to-lay person model of risk communication, and the staged process models of information behaviour proposed by Ellis, Cox and Hall (1993) and Kulthau (1993). This model of effective information dissemination is closer to Leiss and Krewski's (1989) Communications Processes Model (See Figure 1), which suggests information flows between the information provider and the information recipient.

This model of effective information dissemination is, however, unique, in, not only identifying the factors linking the roles of information provider and recipient, but also in identifying the potential barriers to effective information dissemination in a crisis situation.

7.5.2 Implications for dissemination practice

The anticipated outcome of any information dissemination strategy is twofold – an informed audience achieved with the optimum use of resources. The model of effective information dissemination proposed in this research illustrates the elements that ought to be considered by the information provider when adopting an information dissemination strategy. As the model shows there are five elements in particular that ought to be considered in any dissemination strategy.

Consideration of these elements, however, has implications for information providers, which go beyond the actual information dissemination process. Consideration of the concept of targeting information to a specific audience involves gathering a considerable amount of information about the intended recipients before dissemination even takes place. Employing market segmentation techniques, for example, can help information providers to understand their target audience. These

techniques enable analysis of the audience's sociodemographic characteristics, psychological profile and behavioural characteristics. Gaining this understanding will then enable information providers to make more accurate predictions, "which, in turn, are prerequisites to the ability to influence outcomes" (Kotler & Roberto, 1989). The employment of market segmentation techniques to define the target audience, also, invariably highlights a need to adopt a multi-method dissemination strategy.

The identification of the role of opinion leaders in the dissemination strategy requires that information providers should be aware of those individuals who might perform this function in any particular situation. Early diffusion research (Rogers, 1995) identified the attributes of potential opinion leaders. However, as an individual may be an opinion leader in one social network and peripheral in another, "the task of targeting opinion leaders may not always be straightforward" (Crosswaite & Curtice, 1994). The benefits, however, for information providers in identifying opinion leaders are considerable, as "the opinions and behaviour of those who possess status and prestige are likely to have a greater impact upon what spreads through a social network, than the activities modelled by peripheral members" (Bandura, 1986).

The identification of the importance of opinion leaders in the dissemination strategy illustrates that understanding the environment in which the particular information provision effort takes place, is a vital part of effective information dissemination. Again, knowledge of the environment is a key aspect of social marketing, where the focus of the approach is upon market analysis (knowing the environment), market segmentation (targeting the intended audience) and market strategy.

With regard to education and training in the information studies field, the two elements of effective information dissemination together suggest that the social marketing approach to information dissemination should be a core element of education and training for information professionals. Educators in the field of information studies should ensure that practitioners are trained, for example, in not only gathering data about the target audience, but also in manipulating the data to define the target audience accurately. Practitioners will, thus, be armed with the necessary tools to ensure maximum benefit for their audience for the minimum use of the information provider's resources.

7.5.3 Implications for research practice

The identification and development of the qualitative systematic review method employed in this study suggests that researchers in the information studies field can profitably employ research methods more traditionally associated with the quantitative research paradigm. In the multi-disciplinary field of information studies research, where research projects may need to reflect more than one disciplinary perspective, this is particularly important.

The successful completion of the review, moreover, illustrates that the meta-ethnographic approach to synthesis and analysis can operate within the systematic review framework. It is, however, suggested that the qualitative systematic review technique incorporating the meta-ethnographic approach, should be tested by other researchers to provide further evidence of the rigorous appraisal of the technique.

The application of the model of effective information dissemination in the evaluation of the information dissemination process during the crisis in Ponteland, moreover, indicates that the findings of the qualitative systematic review are rigorous and applicable. It is, however, suggested that further research is required to assess the transferability of the model to other crisis situations. In particular, the model should be tested in a contemporary crisis situation to assess whether further elements could be added to the model, as it may be the case that relevant factors have not been highlighted in this study, due to the lapse of time between the crisis and the study.

The third key factor in the model, the willingness to accept new knowledge, was explored in this research as a facet of information behaviour. As a group information monitors are relatively easy to access, however information blunters, on the other hand, are much more difficult to access. Both this study and previous research (van Zuuren & Wolf, 1991) were unable to identify the characteristics of information blunters. The model, however, illustrates the importance of this facet of information behaviour in relation to effective information dissemination.

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7.6 Conclusion

This research project identified the key elements of an effective information dissemination strategy from a qualitative systematic review of the research literature. The meta-ethnographic approach taken to the synthesis and analysis of the review

studies enabled the construction of a model of effective information dissemination. The project, however, aimed to evaluate and characterize the dissemination of information to a community during a crisis. The model of effective information dissemination constructed from the review findings was, thus, utilised as a framework for the evaluation of the dissemination process during the crisis. As a result of this application of the effective information dissemination model to the specific circumstances of the crisis in Ponteland, two important aspects of information dissemination were identified. The evaluation conducted for this study highlighted these two aspects as potential barriers to effective communication. The two aspects were therefore incorporated in the original model to produce a model of effective information dissemination in a crisis.

The research highlights the areas of diffusion research and risk communication as potentially useful areas for collaboration and co-operation in information studies. In addition, this project illustrates the possibility of conducting a study of a medical crisis from an information studies perspective.

The crisis at the heart of this project presented a unique opportunity to study a medical incident from an information studies perspective. Reflecting the multi-disciplinary nature of the field of information studies, this research is situated at the intersection of three distinct research areas. The model of effective information dissemination in a crisis produced in this study, thus, contributes to the research literature in the fields of risk communication and diffusion of innovations, in addition to the contribution this research makes to the field of information studies research.

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Yoder, P Stanley, Horvik, Robert & Chirwa, Ben C (1996) : Evaluating the program effects of a radio drama about AIDS in Zambia Studies in family planning Vol 27 p 188 - 203

Zyzanski, Stephen J. *et al* (1992) : Qualitative research : perspectives on the future *in* Crabtree, Benjamin F. & Miller, William L. (Eds) : Doing qualitative research Sage.

APPENDICES

Surveillance, Prevention and Control
of Communicable Disease

Institute of Pathology
Newcastle General Hospital
Westgate Road
Newcastle upon Tyne
NE4 6BE
Tel 0191-273 3584 Fax 0191-226 0365
E-mail nmlblack@cdcu.demon.co.uk

SL/SDW
17th February 1998

Tuberculous Infection Update 17th February 1998

Since the last information update, confirmatory tests from some schools bordering Ponteland have identified a further 20 children who are skin test positive. This makes the overall rate of positive skin tests 13%. It is still our intention to offer screening to school aged children who are resident in Ponteland and attend school elsewhere. As soon as clinic arrangements are made they will be widely advertised.

We would like to repeat that decisions about testing of pre-school children and testing of children further afield will be made at the next outbreak control team meeting on the 25th of February.

The next meeting will be at Ponteland County Middle School at 7:00 p.m. on the 25th of February. The primary purpose of this meeting is to answer residents' questions: it is unlikely there will be any new developments by this date.

In an effort to make information more widely available, this update will be posted in various public places, e.g., libraries and parish councils, as well as to Ponteland schools and the Education Authorities. Local Medical Councils and Trusts for further distribution. Also, information is available on the internet website:

www.demonweb.co.uk/nhumberld-ha/tb/

We hope this update is helpful and will continue our efforts to keep you informed.

Shelley Lanser, M.P.H.
Staff Epidemiologist
17.2.98

PontelandTB/Update17Feb.let

APPENDIX 1

REVIEW PROTOCOL

The review protocol specifies the pre-determined plan that the research exercise will follow. It states in detail the main question that will be investigated in the review. Defining the question in this manner reduces the possibility of bias in the selection of reported studies. The definition can then be used to develop the specific inclusion/exclusion criteria that will be applied to the retrieved items.

Research question

This review seeks to ascertain the effectiveness of information dissemination strategies. In this instance, the term dissemination is taken to include the distribution of information to any group of users or potential users, rather than the narrower meaning ascribed to the term of information distribution amongst professional/academic groups. The strategies under consideration are therefore the mix of communication techniques utilised in each reported study.

The focus of the review is the form in which the information is disseminated as opposed to the information content.

Search strategy

Although the subject of this systematic review is *information* dissemination, it is deemed necessary to search databases serving general and social science audiences in addition to specifically information and library science databases, as the terms dissemination and communication are frequently interchangeable. Searching a variety of databases will, it is anticipated, recover relevant studies in fields such as business management and education in addition to solely library or information based research.

In order to avoid publication bias, whereby only the results of published studies are included, current research registers will also be searched. Again, this will not be restricted to solely LIS registers.

Acknowledging the fact that delays exist between publication of reports and their inclusion in on-line databases, the most commonly occurring journals appearing in the list of relevant, retrieved items will also be hand-searched. This search will serve the dual purpose of identification of relevant items missed as a result of changes in indexing procedure in addition to the aforementioned.

Similarly, the most frequently occurring authors in the list of relevant, retrieved items will be contacted, where possible, to request publication lists and details of ongoing research in this area. Citation indices will also be checked to highlight articles and reports that have cited any of the studies undertaken by these authors.

Methodology description

As the systematic review technique is a particularly new approach to research in information and library science, the potential number and quality of reported studies in information dissemination is difficult to assess prior to the execution of the search. The inclusion/exclusion criteria are, therefore, purposefully general at this

stage with the option to specify more specific exclusion criteria during the search should the need arise.

Inclusion criteria

It is unclear, at this stage, where the bulk of the research in this area will be concentrated. It is, therefore, essential to ensure that useful studies will not be excluded from the process on the basis of language alone. Accordingly, reported studies in non-English language publications that include an English language abstract and conform to all other inclusion/exclusion criteria will be included in the final analysis.

Unlike systematic reviews undertaken in the field of medicine "gold standards" of research design e.g. Randomised Controlled Trials, are not applicable in the field of information science. All studies that include in the consideration of the effectiveness of particular communication techniques a user perspective will be included in the analysis. Reports of the studies must give a clear statement of the research methodology in order that the rigour of this process can be ascertained. The form which the consideration of the user viewpoint will take cannot, however, be categorically stated at this stage of the review.

Exclusion criteria

Studies that are solely concerned with the technology of information dissemination will be excluded from the analysis. Although technology has an important role to play in dissemination strategies, for the purposes of this review the technological aspects of the process are not under consideration.

Quality assessment

In order to ensure that the quality of the studies included in the final analysis is consistent the studies will be evaluated in accordance with a series of quality criteria. These criteria are based upon the quality assessments recommended by the Social Science Information Gateway for the evaluation of networked information and work in progress at the Dept of Information Studies, University of Sheffield on systematic literature reviews. The criteria for evaluation is :-

Authority – status of author and journal, country of origin
Accuracy - rigour of methodology, currency
Validity - reliability and generality of conclusions

Refereeing process

Throughout the systematic review process a system of refereeing exists to further ensure that bias in the selection of usable studies is avoided. In this case, the referees of the process are the supervision team already in place for the PhD process. Potentially usable titles gleaned from the titles, keywords and abstracts retrieved will be passed to the supervision team for corroboration.

SYSTEMATIC REVIEW SEARCH LIST

Databases

ANTE
Arts and Humanities Index
ASSIA
ASTI
British Education Index
Cinahl
Dissertation Abstracts Online
ERIC
Information Science Abstracts
Library Literature
LISA
Medline
Psyclit
Social Sciences Citation Index
Sociological Abstracts
Wilson Social Science Abstracts

Web-based searches

BUBL
Ingenta Journals
Library Management
OMNI
SOSIG
Uncover
University Web sites
Update-software.com

Miscellaneous sources

BMJ customised alert service
Contents direct table of contents service
LIS – medical mailing list
UNN library catalogue

SYSTEMATIC REVIEW SEARCH TERMS

Information
Communication

Evaluation
Evaluation studies
Usage studies
Consumer satisfaction
User studies
Communication AND user

Dissemination
Communication
Diffusion
Information transfer
Information exchange
Diffusion (communication)
Information services AND distribution

The above terms were used either alone or in conjunction with another depending upon the specific indexing requirements of each source searched.

Qualitative systematic review studies

Atwood, Jan R. *et al* (1991) : Acceptability, satisifaction and cost of a model-based newsletter for elders in a cancer prevention adherence promotion strategy. Patient education and counselling. Vol 37 p221-221.

Bazyk, Susan & Jeziorowski, John (1989) : Videotaped versus live instruction in demonstrating evaluation skills to occupational therapy students The American journal of occupational therapy Vol 43 p 465- 468

Brink, Susan G et al. (1995) : Diffusion of an effective tobacco prevention program : Part 1 : evaluation of the dissemination phase Health education research Vol 10 No 3 p 283 - 295

Browner, C H., Preloran, Mabel & Press, Nancy A. (1996) : The effects of ethnicity, education and an informational video on pregnant women's knowledge and decisions about a prenatal diagnostic screening test Patient education and counselling Vol 27 p 135 - 146

Brunham, Sandra *et al* (1992) : The effectiveness of videotapes in communicating information to rural physiotherapists. Physiotherapy Canada Vol 44 (3) p30-34.

Bush, Mary A A. Butler, & Sabry, Jean Henderson (1977) : Consumer acceptance of mailed nutrition and health information Canadian journal of public health Vol 68 p 296 - 300

Graham, Wendy et al. (2000) : Randomised controlled trial comparing effectiveness of touch screen system with leaflet for providing women with information on prenatal tests BMJ 320 p 155 - 160

Lechner, L & De Vries, H. (1996) : The Dutch cancer information helpline : experience and impact Patient education and counselling Vol 28 p 149 - 157

Llewellyn - Thomas, Hilary A et al (1995) : Presenting clinical trial information : a comparison of methods Patient education and counselling Vol 25 p 97 - 107

Luck, Andrew *et al* (1999) : Effects of video information on precolonscopy anxiety and knowledge : a randomised trial. The Lancet Vol 354 Dec 11 p2032-2035.

McGill, Deborah & Joseph, W D (1997) : An HIV/AIDS awareness prevention project in Sri Lanka : evaluation of drama and flyer distribution interventions International Quarterly of community health education Vol 16 (3) p 237 - 255

Nelson, Patricia Tanner (1986) : Newsletters : an effective delivery mode for providing educational information and emotional support to single parent families? Family relations Vol 35 p 183 - 188

Rasanen, Leena., Ahlstrom, Antti & Rimpela, Matti (1974) : Pretesting the channels of distribution for a nutrition education leaflet Scandinavian journal of social medicine Vol 2 p 135 - 140

Rimer, Barbara K *et al* (1999) : The impact of tailored interventions on a community health centre population. Patient education and counselling Vol 37 p125-140.

Schofield, Margot J , Edwards, Kim & Pearce, Robert (1997) : Effectiveness of two strategies for dissemination of sun-protection in New South Wales primary and secondary schools. Australian and NewZealand journal of public health Vol 21 (7) p743-750.

Sox, Harold C et al (1984) : Tutored videotape instruction in clinical decision making Journal of medical education Vol 59 p 189 - 195

Tietge, Nancy S., Bender, Stephen J & Scutchfield, F Douglas (1987) : Influence of teaching techniques on infant car seat use Patient education and counselling Vol 9 p 167 - 175

Turner, Bonnie J., Martin, Garth & Cunningham, John A (1998) : The effectiveness of demonstrations in disseminating research-based counselling programs Science communication Vol 19 No 4 p 349 - 365

Whitaker, Carol et al. (1994) : An evaluation of communication strategies during the process of incorporating a college of health studies into a university Journal of advanced nursing Vol 19 p 653 - 658

Yoder, P Stanley, Horvik, Robert & Chirwa, Ben C (1996) : Evaluating the program effects of a radio drama about AIDS in Zambia Studies in family planning Vol 27 p 188 - 203

QUALITY ASSESSMENT

To ensure that the quality of the studies included in the final analysis is consistent the relevant studies will be evaluated in accordance with the following criteria :-

Authority i.e. that the status of the researchers undertaking the study, the status of the organisation to which they are affiliated and the authority of the journal in which the relevant article was published are of sufficient merit to allow reliance upon their accounts.

	1	2	3	4	5	6	7	8	9	10	11	12
Journal status												
Author status												
Organisation status												

Auditability i.e that the quality of the research process in each study is sufficient for it to be included in the analysis. This checklist aims to determine whether the process of the research is consistent with the principles of rigorous qualitative research.

Are the research questions clear?												
Is the study design relevant to the research question?												
Were data collected across the full range of appropriate respondents?												
Is the sampling strategy specified?												
Are the findings consistent across the data sources?												

Are the conclusions reached valid for the context of the study?												
Are areas of uncertainty identified?												
Does the researcher define the boundaries of any generalisations from the study?												
Were any predictions made in the study?												
How accurate were the predictions made?												

Validity i.e. that the conclusions reached are a true reflection of the study's findings and that where generalisations are made these acknowledge any limitations inherent in the study.

Refereeing process

The supervision team perform the refereeing function for this specific review. Using the criteria above they are requested to tick all of the criteria that apply to each of the studies identified by the reviewer as relevant.

10th July, 2000

xxxxx
XXXXXXX
XXXXXXX
XXXXX
XXXXX
XXXXX

Dear XXXXXX,

My name is Fiona Duggan. I am currently undertaking a PhD study in the School of Information Studies at the University of Northumbria at Newcastle.

For my PhD research I am investigating the dissemination of information during the 'TB' incident in Ponteland in early 1998. I am sure you will recall that this was the main topic of conversation in Ponteland and the surrounding area at the time and coughing anywhere in public was ill advised to say the least!

My research so far has shown that studies of information provision in situations such as that experienced in Ponteland are rare, and seldom incorporate the views of the individuals involved in the incident. I want to ensure that all the aspects of information provision during the incident are included in my study and would, therefore, like to talk to the people who were involved in distributing information throughout the incident, hence this letter. I would like to discuss with you your involvement in the ways in which the community was kept informed during the incident. I know that you have many demands upon your time but I would expect that this will take no more than one hour and I will be happy to talk to you at a time and location that is convenient to yourself.

If you wish to find out more about the research before agreeing to talk to me you can contact me by e-mail at fiona.duggan@unn.ac.uk or by post at the above address. If you would rather contact me by phone you can reach me on XXXXX XXXXXX. Please leave contact details if I am not available and I will call you back.

If you would like to take part in this study please complete and return the attached consent form. I have enclosed a pre-paid envelope for your convenience. When I receive your consent form I will be in touch to confirm the interview details.

I do hope that you will be willing to participate in the study, as the views of the actual participants in the process are a vital part of the research and any assistance that you can give would be greatly appreciated.

Sincerely,

Fiona Duggan
Research Student
School of Information Studies

APPENDIX 7

Research Consent Form

This form requests the consent of prospective participants in research being conducted by Fiona Duggan, a PhD research student in the School of Information Studies at the University of Northumbria at Newcastle. The research focuses on the methods used to disseminate information in Ponteland during the 'TB' incident in 1998.

The study will not require participants to undertake any additional work to participate in the research other than agreeing to a personal interview with Fiona Duggan. Data from interview transcripts will be used to inform the study conclusions, although no individual contributions to the study will be attributed. Interview transcripts will be completed by Fiona Duggan and coded to ensure anonymity. The interview data used in support of the conclusions will form part of the final thesis submitted to the University Research Degrees Committee. Journal papers and conference presentations arising from the research will also include supporting interview data. In all of these instances no individual contributions to the study will be attributed.

Please understand that the project does not incorporate any procedures or requirements that may be found ethically objectionable. Participation in the study is entirely voluntary. You have the right to contact the following person and report any objections, either orally or in writing, if you find any procedure or requirement ethically objectionable in the future.

Head of the School of Information Studies
Lipman Building
University of Northumbria at Newcastle
Newcastle upon Tyne
NE1 8ST

Thank you for your time. If you are willing to participate in the research please complete the consent form below. I look forward to hearing from you in due course.

Fiona Duggan
PhD research student
School of Information Studies
Lipman Building
University of Northumbria at Newcastle
Newcastle upon Tyne
NE1 8ST

I am willing / unwilling to participate in this research

Name _____

Address _____

Tel no _____

I am available for interview on _____ at _____

23rd November, 2000

XXXXXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXXXX
XXXXXXXX
XXXXX
XXXXXXX

Dear ,XXXXXXX

TB INCIDENT RESEARCH

I am currently undertaking a PhD study in the School of Information Studies at the University of Northumbria at Newcastle. The project is investigating the dissemination of information during the 'TB' incident in Ponteland in early 1998. As part of the research I am conducting interviews with individuals involved in the distribution of information to the community during the incident. I wrote to you recently to request an interview but as I have not yet received a response to this request it is likely that either my original letter or your response has been lost in the post. I am, therefore, sending this request again in the hope that we may be able to combat the vagaries of the postal system this time.

My research so far has shown that studies of information provision in situations such as that experienced in Ponteland and the surrounding area are rare, and seldom incorporate the views of the individuals involved in the incident. From the interviews that have already taken place it appears that a variety of approaches were taken to distributing information. XXXXXXXXX such an important part in the whole process and, I understand from XXXXXXXXXX XXXXXXXXXXXX, that you were the manager in charge at the time. I am, therefore, particularly interested in learning about your experience of the information distribution process during the incident. The project aims to produce a model of best practice for information practitioners and it would therefore be extremely valuable both to myself and to the intended audience for the research findings if all the approaches to the distribution process are incorporated in the research. I appreciate that you have many commitments and I would, therefore, anticipate taking up no more than an hour of your time and will be happy to talk to you at a time and location that is convenient to yourself.

To comply with research requirements I would be obliged if you could complete and return the attached consent form. I have enclosed a pre-paid envelope for your convenience. Upon receipt of the form I will be in touch to confirm the interview details.

If you would prefer to contact me by e-mail you can do so at fiona.duggan@unn.ac.uk or by post at the address above. If you wish to contact me by phone you can reach me on XXXXXXXXX. Please leave contact details if I am not available and I will call you back.

Sincerely,

Fiona Duggan
Research Student
School of Information Studies

INTERVIEW GUIDE

Introduction and purpose of study, stress not medical

Priorities

Measures of effectiveness

Range of methods employed

Newsletters – literacy levels

Schools	Role of Headteachers
	Staff briefing?
	Deciding what to send out
	Dealing with problems
	Role of education authority
Health	Helpline – was it used?
	Press contact and coverage
	Opinion leadership

29th March, 2001

Dear Pupil,

TB incident in Ponteland

My name is Fiona Duggan and I am a PhD research student in the School of Information Studies at the University of Northumbria at Newcastle. In my studies I am looking at how information was passed on in Ponteland and the surrounding area during the TB incident exactly three years ago.

If you remember, three years ago it seemed that a lot of schoolchildren in Ponteland had been in contact with someone who was ill with TB. Almost all of the schoolchildren in Ponteland had an injection of six needles on their wrist. Depending upon whether or not you had six bumps on your wrist a few days later, some children had another injection in their arm (called a BCG), some children went to hospital for a chest x-ray and some children took pills every day for about six months.

In this questionnaire I want to discover how you found out about what was happening in Ponteland during this time. This is not a test to find out what you know about TB so there are no right or wrong answers to the questions. If you cannot remember some of the things you are asked just miss the question and go on to the next one.

If you have been given this questionnaire but you were not living in or attending school in Ponteland three years ago please just ignore the letter and questionnaire.

The contents of the completed questionnaires will not have your name on it at all and will not be seen by anyone other than myself. If you want to find out more about my research before you fill in the questionnaire you can contact me by e-mail at fiona.duggan@unn.ac.uk or by post at the address at the top of this letter. It is entirely up to you whether or not you complete the questionnaire. I do hope, however, that you will complete the questionnaire, as finding out how children in Ponteland and the surrounding area received information during the TB incident is an important part of my research project.

A pre-paid envelope is attached for you to use to return the questionnaire to me. Thank you for taking the time to read this letter.

Sincerely,

Fiona Duggan
Research Student
School of Information Studies

TB incident in Ponteland

Completing this questionnaire is entirely voluntary. It should only take a few minutes to fill in the questionnaire as you only need to tick a box to answer most of the questions. If you are not sure of the answer to a question or you don't understand a question just leave the answer blank and go on to the next question.

To answer the questions you will need to think back to this time three years ago. It might help to remember how old you were then, what class you were in and who your teacher and friends were.

Q.1

First of all I want to know some details about you so that I can see, for example, if there are any differences in the answers given by boys or girls or between different age groups.

Are you a Boy ☐ Girl ☐

How old are you? _____

Is English the language you speak at home? Yes ☐ No ☐

Did you attend school in Ponteland three years ago? Yes ☐ No ☐

Q.2

Some of the ways in which people in Ponteland found out what was happening during the TB incident are listed below. Tick the boxes next to ANY of the ways that <u>you</u> found out what was happening in Ponteland.

Talking to my teachers ☐
Watching television news about the incident ☐
Reading the newsletters from School ☐
Talking to my friends ☐
Going to the public meetings ☐
Talking to my parents ☐
Reading newspaper articles about the incident ☐
Talking to the School Nurse ☐
Another way not listed
(please write it here) _____ ☐

None of these ☐
(If you ticked none of these go straight to Q. 5 now) ⇒

P.T.O

Q.3

Which of the ways that you ticked explained most clearly to you what was happening in Ponteland?
(Tick ONE box only)

Watching television news about the incident	☐
Talking to the School Nurse	☐
Going to the public meetings	☐
Talking to my parents	☐
Reading the newsletters from School	☐
Talking to my teachers	☐
Reading newspaper articles about the incident	☐
Talking to my friends	☐
Another way not listed	☐

Q.4

Can you tell me how this way explained most clearly what was happening?

_____
_____
_____
_____
_____

Q.5

If you said that you didn't find out what was happening by any of the ways listed, tick the box next to ANY of the following reasons that apply to you?

I didn't see any newsletters	☐
I didn't want to know about the incident	☐
I didn't see any television news about the incident	☐
I can't remember how I found out what was happening	☐
I didn't see any newspaper articles about the incident	☐
Another reason	
(please write it here) _____	☐

Thank you very much for taking the time to fill in this questionnaire. I really appreciate your help.

30th March, 2001

Dear Sir or Madam,

TB incident in Ponteland

My name is Fiona Duggan and I am a PhD research student in the School of Information Studies at the University of Northumbria at Newcastle. As part of my studies I am looking at the distribution of information during the "TB incident" in the Ponteland area.

As you will no doubt recall the incident happened three years ago at the beginning of 1998, when an unusually high number of children in the Ponteland area appeared to have been in contact with the TB virus. At the time this was the topic of many conversations in Ponteland and the surrounding area and coughing anywhere in public in Ponteland was ill advised to say the least!

I have already studied reports of similar incidents and talked to the individuals involved in managing the situation in Ponteland, but to complete the picture I need the views of people who were living or working in Ponteland and the surrounding area at the time, hence this letter and the enclosed questionnaire. If you were in the area at the time I would be really grateful if you could spare a few minutes of your time to complete the questionnaire. I am only interested in finding out about how information was passed on during the incident, so rest assured that you do not need to have any particular medical knowledge to complete any of the questions.

If you were not living or working in Ponteland or the surrounding area at the time of the "TB incident" please ignore this letter and questionnaire and accept my thanks for taking the time to read this letter.

The contents of the questionnaires will remain completely confidential. If you wish to find out more about the research before completing the questionnaire you can contact me by e-mail at fiona.duggan@unn.ac.uk or by post at the above address. Please understand that the process does not incorporate any procedures or requirements that may be found ethically objectionable and participation in the study is entirely voluntary.

I do hope that you will be willing to participate in the study as the views of the people in the Ponteland area at the time are a vital part of the research. I have enclosed a pre-paid envelope for your convenience and I look forward to receiving your response by Friday 13th April if possible. Your assistance is very much appreciated.

Sincerely,

Fiona Duggan
Research Student
School of Information Studies

Enclosure (2)

TB incident in Ponteland

To minimise the time taken to complete the questionnaire the majority of the questions require only that you circle a number as a response. There is space, however, at the end of the questionnaire for any comments that you may wish to add.

SECTION A NEWSLETTERS

One of the main ways used to pass on information in Ponteland during the TB incident was by newsletter. The newsletters were issued regularly by the health officials involved and distributed through the schools. They were also available in places such as the library, the supermarket and on a web-site.

A 1 Did you read any of the newsletters issued during the TB incident?
(please circle as appropriate) YES/NO

If you ticked **NO** please go straight to **section B**

A 2 How effective do you think the newsletters were in providing information?
(please read each statement and circle a number to tell me your views. 1 indicates strong agreement, 6 indicates strong disagreement and 7 tells me that the particular statement does not apply to your situation)

	Strongly agree					*Strongly disagree*	*Not applicable*
The contents of the newsletters addressed all of my concerns about the incident	1	2	3	4	5	6	7
Newsletters kept me up-to-date with what was happening	1	2	3	4	5	6	7
The newsletters contained medical terms I was not familiar with	1	2	3	4	5	6	7
I discussed the contents of the newsletters with my children	1	2	3	4	5	6	7
I found the information in the newsletters reassuring	1	2	3	4	5	6	7
It was still important to read the newsletters after the possibility of a TB outbreak receded	1	2	3	4	5	6	7
Information in the newsletters reflected the situation at the time	1	2	3	4	5	6	7
It was important to know where the information in the newsletters originated from	1	2	3	4	5	6	7

P.T.O.

SECTION B PUBLIC MEETINGS

In addition to the newsletters, a number of public meetings were held at both of the Middle Schools in Ponteland and in the Memorial Hall. This section of questions relates to these meetings.

B 1 Did you attend any of the public meetings held about the incident?
(please circle as appropriate) YES/NO

If you ticked **NO** please go to question **B3**

B 2 How effective do you think the public meetings were in providing information?
(please read each statement and circle a number to tell me your views. 1 indicates strong agreement, 6 indicates strong disagreement and 7 tells me that the particular statement does not apply to your situation)

	Strongly agree					Strongly disagree	Not applicable
The meetings were an opportunity to raise my concerns with the appropriate officials	1	2	3	4	5	6	7
Medical terms used at the meetings were always clearly explained	1	2	3	4	5	6	7
I felt satisfied after the meetings that everything possible was being done to protect the community	1	2	3	4	5	6	7
There was no need to attend meetings after the possibility of a TB outbreak diminished	1	2	3	4	5	6	7
Information was given at the meetings which reinforced the details in the newsletters	1	2	3	4	5	6	7
It was important to me to hear the information directly from the people involved	1	2	3	4	5	6	7
It was reassuring to know that some of the health professionals were personally involved	1	2	3	4	5	6	7

Please go now to Section C ⇒

B 3 If you did not attend any of the public meetings held please indicate your reasons for non-attendance by ticking the appropriate boxes below.

(please tick ALL that apply)

Not aware of the meetings ☐
Prior commitment ☐
Inconvenient time ☐
Inconvenient venue ☐
No need for more information ☐
Other ☐
(please specify) _____

SECTION C MEDIA COVERAGE

As well as the direct sources of information about the TB incident, i.e. the newsletters and public meetings, information was passed on by other means. In the media a number of items about the incident appeared in local and national newspapers and also in television news programmes. The following questions relate to these items.

C 1 Did you read any articles about the incident in the local or national press? YES/NO
(please circle as appropriate)

C 2 Did you watch any items about the incident on television? YES/NO
(please circle as appropriate)

If you answered **NO** to **BOTH** of these questions please go to question **C4**

C 3 How effective do you think the media were in providing information about the incident?
(please read each statement and circle a number to tell me your views. 1 indicates strong agreement, 6 indicates strong disagreement and 7 tells me that the particular statement does not apply to your situation)

	Strongly agree					Strongly disagree	Not applicable
Television coverage first alerted me to the incident	1	2	3	4	5	6	7
Newspaper coverage gave an accurate portrayal of the events in Ponteland	1	2	3	4	5	6	7
Newspaper articles used medical terms I was not familiar with	1	2	3	4	5	6	7
Children watched television coverage of the incident at home	1	2	3	4	5	6	7
I found television coverage of the incident reassuring	1	2	3	4	5	6	7
Reading newspaper articles increased my concerns about the situation	1	2	3	4	5	6	7
Newspapers were only interested in the incident when it was a possible TB outbreak	1	2	3	4	5	6	7
Television coverage did not use complex medical terms	1	2	3	4	5	6	7
Children read newspaper articles on the incident at home	1	2	3	4	5	6	7
Newspaper coverage was not intended to reassure readers	1	2	3	4	5	6	7
I learned most about the incident from newspaper articles	1	2	3	4	5	6	7
I learned most about the incident from television coverage	1	2	3	4	5	6	7

Please go now to **Section D** ⇒

P.T.O.

C 4 If you did not read newspaper articles or watch television coverage about the TB incident please indicate your reasons by ticking the boxes below.
(please tick ALL that apply)

Don't read newspapers	☐
Don't watch television	☐
No articles published in the newspaper I read	☐
Incident not covered on television when watching	☐
Preferred not to read articles	☐
Preferred not to watch television coverage	☐
Other	☐

(please state) _____

SECTION D ONE TO ONE

In addition to the printed sources already mentioned information was also passed on informally during the incident. Contacting a telephone helpline or a face to face conversation with individuals whose opinion you valued are two ways that information may have been passed to you during the incident. The questions in this section relate to the part that these informal conversations played for you during the incident.

D 1 Were you aware that the Communicable Disease Unit offered a contact telephone number during the incident? YES/NO
(please circle as appropriate)

D 2 Did you contact any of the following informal sources of information during the incident?
(please tick ALL that apply)

Communicable Disease Unit contact number	☐
Own GP	☐
Other GP	☐
School Medical Officer	☐
School Nurse	☐
School Head teacher	☐
Friends employed in the Health Service	☐
Relatives employed in the Health Service	☐
Friends (other than above)	☐
Relatives (other than above)	☐
Other (please specify)_____	
Did not contact anyone	☐

D 3 How important for you were these informal sources of information?
(please read each statement and circle a number to tell me your views. 1 indicates strong agreement, 6 indicates strong disagreement and 7 tells me that the particular statement does not apply to your situation)

	Strongly agree					Strongly disagree	Not applicable
Talking to health officials increased my concerns	1	2	3	4	5	6	7
I preferred not to discuss the incident in front of children	1	2	3	4	5	6	7
The contact number gave me the opportunity to discuss my specific concerns	1	2	3	4	5	6	7
I discussed the incident with friends to help me to understand the medical terms used	1	2	3	4	5	6	7
I received conflicting information when I discussed the incident with health professionals	1	2	3	4	5	6	7
I discussed the incident most when the possibility of a TB outbreak was highest	1	2	3	4	5	6	7
It was reassuring to talk to other people in the same situation	1	2	3	4	5	6	7

SECTION E THE COMMUNITY

This final section will give me information about the community in Ponteland. All of the responses in this section are optional and will remain strictly confidential. The questions are simply to allow me to assess any differences in responses from various sections of the community.
(please tick the appropriate response)

E 1 Are you? Male ☐ Female ☐

E 2 Which age group do you belong to?
16 – 25 ☐ 26 – 35 ☐ 36 – 45 ☐ 46 –55 ☐ 56 –65 ☐ 66+ ☐

E 3 How many of the following are there in your household?
Adults _____
Children 7 - 16 _____

E 4 Please indicate the highest level of your educational qualifications
GCSE (or equivalent) ☐
A level (or equivalent) ☐
University degree ☐
Other professional qualifications ☐
Post graduate qualification ☐
None of the above ☐

E 5 Is English your first language? YES/NO
(please delete as appropriate)

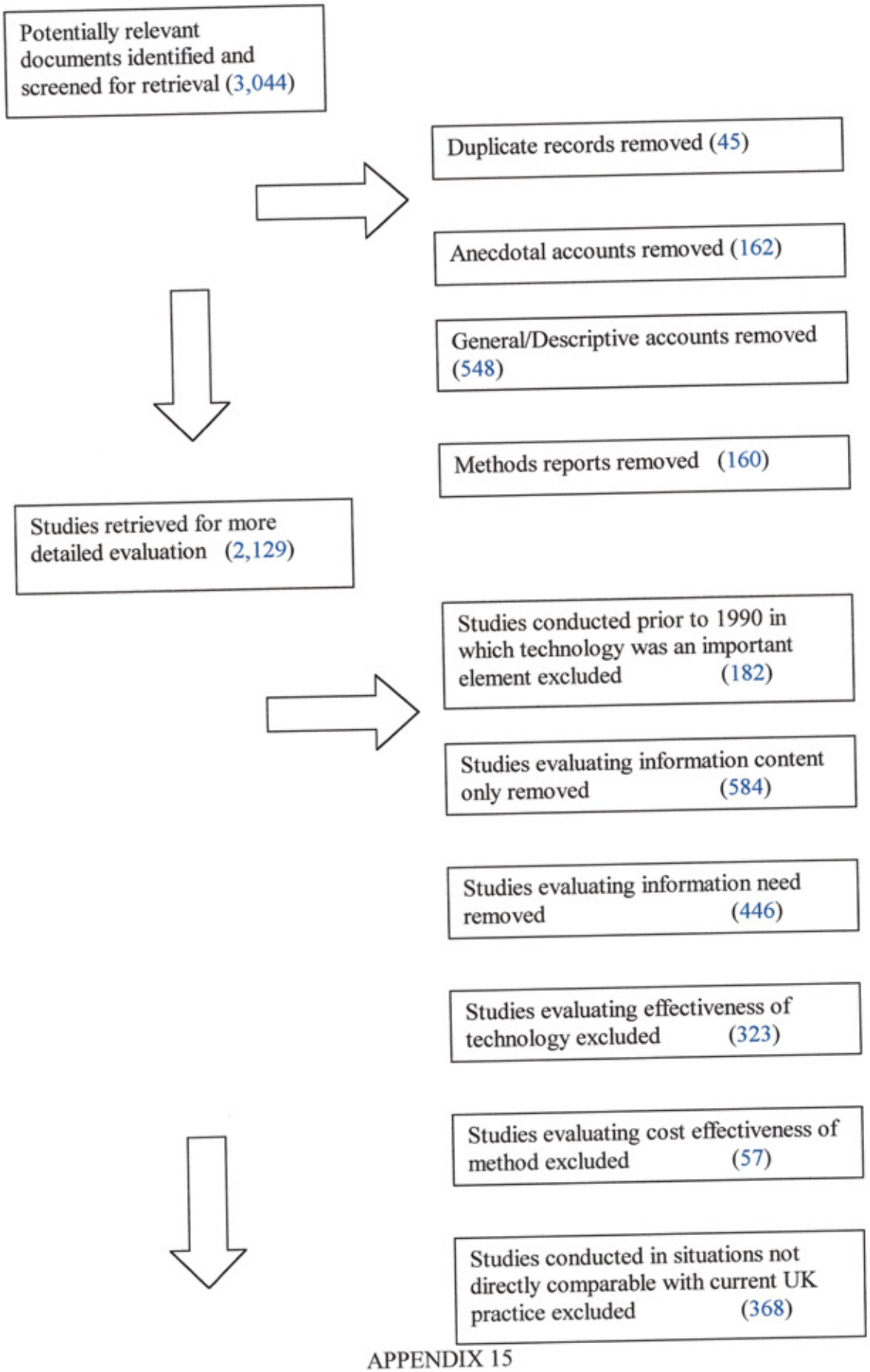
P.T.O.

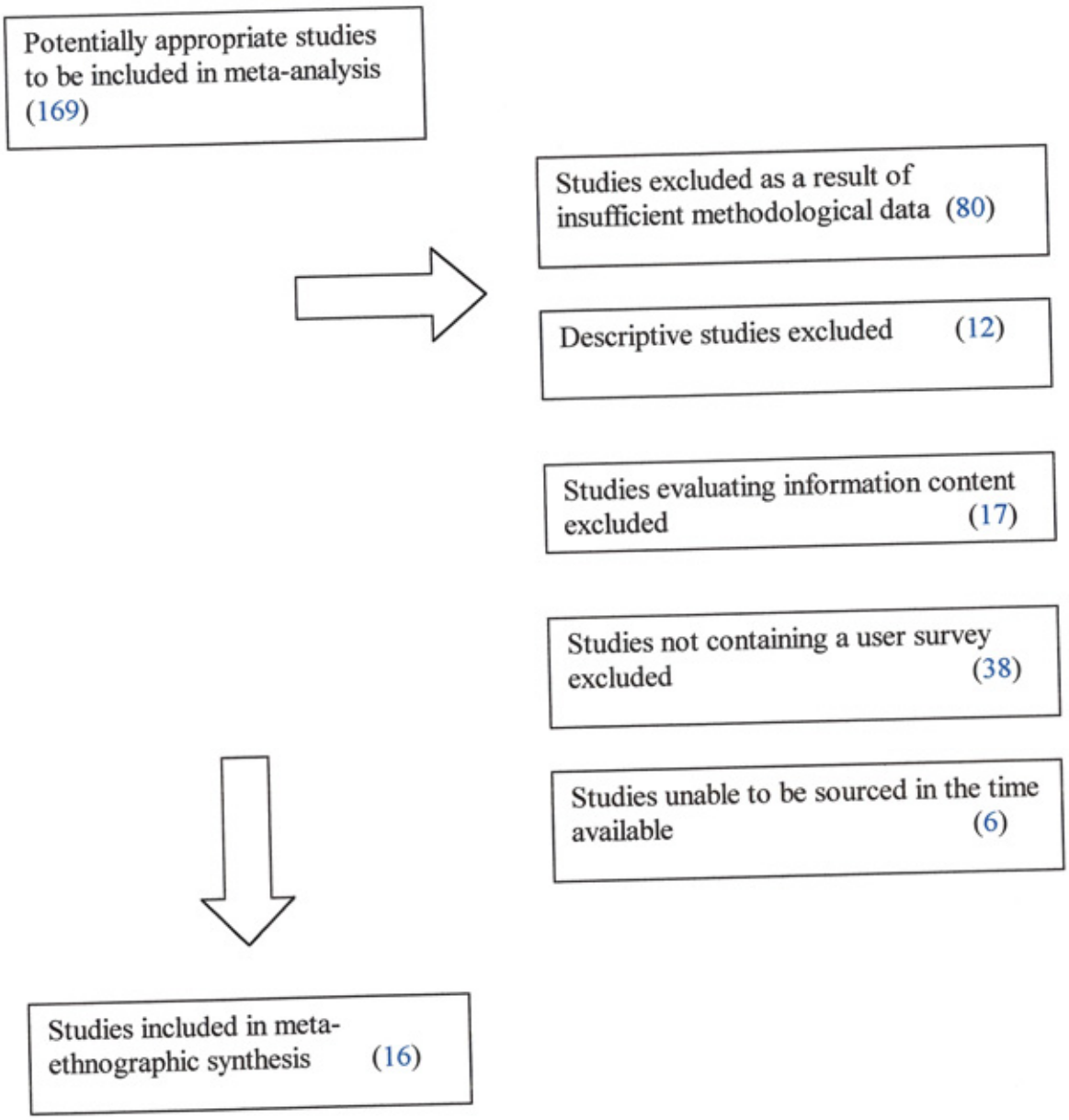
The space below is for any additional comments that you may wish to make.

If you would be willing to be interviewed by telephone at a later date for this research please add your name and telephone number below (*please state whether this is a day or evening number. Interview data and questionnaire responses will remain confidential.*)

Thank you for taking the time to complete this questionnaire. Your co-operation is greatly appreciated.

QUORUM statement flow diagram




Potentially appropriate studies to be included in meta-analysis (169)
Studies excluded as a result of insufficient methodological data (80)
Descriptive studies excluded (12)
Studies evaluating information content excluded (17)
Studies not containing a user survey excluded (38)
Studies unable to be sourced in the time available (6)
Studies included in meta-ethnographic synthesis (16)

Extraction of key factors

Measures of effectiveness

→ Changes in behaviour

→
- *Sharing knowledge with others (1, 13)*
- *Intrafamily discussions about risk (3)*
- *Compliance with treatment regime (8, 6)*
- *Compliance with test programme (10, 19)*
- *Policy adoption (2)*
- *Proper and consistent use of child safety seats (11)*

→ Change in attitude

→
- *Increased sense of risk (3, 1)*
- *Impact on anxiety levels (12, 19, 20)*
- *Willingness to implement new programme (13, 15)*
- *Increased confidence in abilities (7)*
- *Perceived benefits of trial / change (9, 14)*
- *Decreased feeling of professional isolation (6)*

→ Change in knowledge

→
- *Topic recall (4, 7, 16, 18)*
- *Understanding of purpose of test/ trial (14, 19)*
- *Awareness of treatment advances (6)*
- *Increased knowledge of assessment tool (5)*
- *Increased knowledge of assessment decision (17)*
- *Increased knowledge of risk behaviour (3)*
- *Knowledge change before and after event (1)*

→ Cost-effectiveness

- *Cost effectiveness of method (8)*
- *Cost effectiveness of programme (13)*
- *Reduced programme costs (7)*

Evaluation

→
- *Study design limited by ethical concerns (14)*
- *Aversion to randomisation (14)*
- *Difficult to show further positive movement (13)*
- *Population did not respond dramatically (11)*
- *Extended community participation increased awareness (1)*
- *Changes could not be linked to intervention alone (3)*
- *Importance of other factors outwith study(12)*
- *Participants already had a positive attitude (12)*
- *Earlier campaigns and population's positive attitude (16)*
- *A sensitive measure of degree of awareness (18)*
- *Difficult to exclude other confounders (2)*
- *High participation due to charging structure (15)*
- *Both groups showed improvements (19)*

Cultural constraints
→
Social sanctions against reported behaviour (3)
Cultural reluctance to discuss topic openly (1)
Conflict between message and traditional habits (16)
Black women less likely to be advised (10)
Concept virtually absent in traditional Mexican culture (4)
Lack of clear role for teachers (13)
Adapting to new organizational culture (9)

Socio-economic factors
→
Literacy and education levels (1, 3, 4, 8, 11, 16, 18)
Access to mass media (1, 3, 18)
Community participation (18)
Age of recipients (8)
Gender of recipients (7, 10, 14, 20)
Ethnic origin (4, 7, 10, 11)

Other sources of information
→
Primary sources – TV and newspapers (1)
Province had numerous ways to learn (3)
Previous sources of information on topic (18)
Previous interest in topic (15, 17)
Interpersonal channels (8)
Baseline level of knowledge already high (11, 19)
Alternative ways of getting information (13)
Respondents obtained answers by other means (9)

Reinforcement of existing knowledge
→
Audience had a good understanding before (1)
Reinforcing existing knowledge (18)
Recall derived from previous interest in topic (16)
Improvement from a high starting point (19)
Schools receive a vast amount of information (2)
Legally required to give patients booklet (4)
National and state effort to increase awareness (11)
Controversy surrounding widespread use of test (4)
Focus groups provided local knowledge (3)

Research based information
→
Topics evolved from research literature (7)
One of the most intensively researched subjects (19)
Interventions that had good empirical support (10)
Topics based on an established model (8)
Cost-effective, research based treatment (15)
Based on recommendations by Medical Boards (16)
Constructed from pre-existing literature (1)
Consistent with messages drawn from research (3)
Information derived from a clinical trial (14)
The script addressed theoretical constructs (13)

Perceived relevance of the information

→ *Highlights women's receptiveness to information (19)*
The materials were 'meant for me' (10)
Demonstration had increased their interest (15)
Intended to read it later (16)
A third elected not to accept the information (18)
Generally held belief that AIDS is a foreign problem (1)
Someone they knew had AIDS (3)
Think that students would not co-operate (2)
Already aware of preventative behaviour (11)
Thought a lot before deciding (4)
See the information as more relevant to them (13)
Wanted information specific to their situation (12)
'It voiced my own views' (7)

Interaction with the information

→ *Found it easier to interrupt the tape to ask (17)*
Did not like limited interaction with instructor (5)
Influential because colleagues had been involved (15)
89% planned to share their information (1)
Session included actual practice by the subject
Respondent actively involved in information search (14)
Both groups had expectations from their interaction(12)
Enthusiastic about one-to-one meetings (9)
Students disliked the restriction (5)
Format associated with a more positive attitude (14)

Participant involvement in strategy

→ *If given a choice would prefer live instruction (5)*
Counsellor may have helped to draw attention (10)
Community leaders asked for intervention (1)
Church leaders asked to tell congregations (3)
Encourage physicians to take an active role (11)
Strategies were two-way processes (9)
Representatives asked to show and discuss video (13)
Opinion leaders attendance increased discussion (13)

Recognition of need for new knowledge

→ *Previous experience did affect anxiety scores (20)*
Women perceived the problem as much greater (1)
Considered the most serious health problem in area (3)
Issue not seen as sufficiently high priority (2)
Feeling obligated to learn all that they can (4)
Gaining new ideas scored the lowest (6)
Receptivity was extremely favourable (13)
Four main areas of concern (9)
I think something is only my problem (7)
Lack of access to new ideas is a big problem (6)
Claimed to always read the pamphlets (18)
Opportunity to ask questions if unclear (5)

C

Information seeking style

→

Preference for shared decision making (14)
Most said they had only skimmed it (4)
A greater need for interpersonal feedback (12)
Prefer live demonstration as it is more reliable (5)
Effect of information on anxiety is controversial (20)
Demonstrations may persuade adopters (15)
People tend to retain leaflets (16)
Chose not to accept information by ignoring (18)
Concept of 'teachable' moment (11)
Refusers tended to be women (14)
Do not incorporate the information (13)
Elected not to use workshops or meetings (9)

Awareness of information sources

→

More aware if information provided orally (15)
Supported by similar information via other media (16)
Had heard of guide before reading pamphlet (18)
Learned primarily from the media (1)
Receiving information from many sources (3)
Already aware of preventative behaviours (11)
Feeling obligated to learn all they can (4)
Most became aware through media channels (13)
Obtained answers by other means (9)
Would not have easy access to expert knowledge (6)

Willingness to change as a result of new information

→

Demonstration had influenced their interest (15)
Claimed to have discussed at least one pamphlet (18)
Shift towards seeking the clergy out for advice (1)
Difficulty of transposing unit setting to rural setting (6)
Staff were positive about impending incorporation (9)
A number of attitudes and behaviours were changed (7)
Self-efficacy was targeted continually (8)
Respondents able to use their own strategies (14)
Thought a lot before deciding to take test or not (4)
Indicative of what people think they should be doing (3)
Receptivity towards programme very favourable (13)

PUBLISHED PAPERS

Paper published in Banwell, Linda and Collier, Mel (Eds) (2002) Human aspects of the information society, an international collection of papers IMRI, Northumbria University

Dissemination – Divide and conquer

Duggan, Fiona H. & Banwell, Linda

Introduction

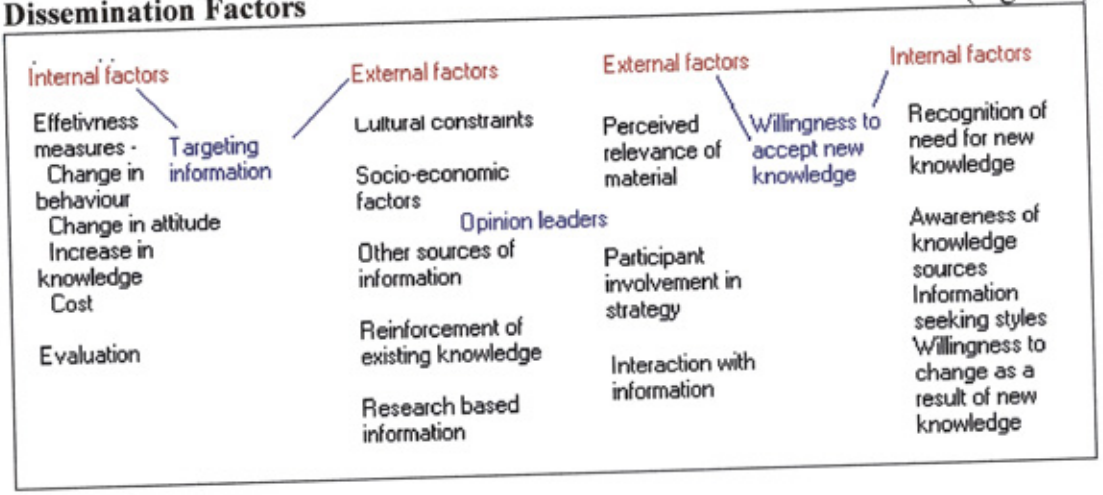
This paper stems from a doctoral research project, currently in its final year, which studies the dissemination of information to Ponteland, a community in Northumberland, during a health crisis. The award of an AHRB research studentship funds the project. The broad aim of the research is to characterise and evaluate the dissemination of information during the crisis. The paper will discuss the process of characterising information dissemination and then focus upon the necessity for and implications of targeting information to the specific audience, a key factor in effective dissemination.

Background

Previous research, reviewed in the paper, regarding information dissemination in crisis situations focuses mainly upon management issues. The concerns and views of the recipients of information are rarely sought or heeded. There is, however, a considerable body of research relating to information dissemination in non-crisis situations and, increasingly, the user's viewpoint is included in the research process. The first stage of the current project sought to determine the existing models of effective information dissemination from this body of research. The method used in this stage of the project was a qualitative systematic review of the research literature considering the effectiveness of various dissemination strategies. This technique, discussed in more detail in the paper, is utilised in medical research specifically "to bring together a number of separately conducted studies and synthesise their results." [1] The aim of this particular review was to identify from a wide spectrum of qualitative research studies the effectiveness of information dissemination strategies. Synthesis and analysis of the studies identified by the review revealed that no one dissemination method is consistently effective. By focusing on the key concepts within the studies, however, key factors were highlighted, which in combination contribute to effective dissemination. These key factors are illustrated graphically below. (Figure 1)

(Figure 1)

Dissemination Factors



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Paper published in Banwell, Linda and Collier, Mel (Eds) (2002) Human aspects of the information society, an international collection of papers IMRI, Northumbria University

Although no one factor, considered in isolation, is more important for effective dissemination than any other, the three factors, highlighted in blue in the diagram, constitute vital links between the information disseminator and the recipient. One of these factors, targeting information, is the focus of this paper.

Targeting the information

Targeting information is one of the key elements of social marketing strategies. The social marketing model of information dissemination is particularly prevalent in health promotion and underpins many campaigns targeted at specific groups of individuals, for example smokers. To target information effectively a considerable amount of knowledge about the intended audience is required. Market segmentation techniques are used to define the target audience and analyse their sociodemographic characteristics, psychological profile and behavioural characteristics.

Market segmentation

Education levels are one of the prime attributes that must be determined by the information provider. Failing to recognise variations in the literacy levels of the intended audience can create barriers to effective dissemination. In Ponteland the disseminators stated that they were dealing with a "*well educated, middle class*" audience (quote from an interview with a Health Official) and tailored their information accordingly. In this specific situation, however, children between the ages of 5 and 12 were, in fact, at the centre of the crisis and it is now acknowledged that ignoring the children was "*one glaring deficiency*" in the strategy adopted (quote from an interview with a Health Official). The newsletter used as the primary method of dissemination was adapted to reflect the literacy levels of the intended readership in some instances but this was a particular decision by individuals involved in the process to *"try and get it through without it being jargon"* (quote from an interview with an Education Official).

Analysis of the audience' psychological profile is perhaps a more complex process than defining sociodemographic characteristics. The paper will discuss how this analysis involves consideration of the values, motivation and attitudes of the target audience. Accurate targeting of information increases the perceived relevance of the information for the recipient and has been described as receiving information "meant for me."[2] The more relevant the information is deemed to be by the individual the more likely they are to act upon it. In Ponteland a series of public meetings were held to inform the community of the progress of the medical enquiry. The final meeting was abandoned when not one individual appeared at the venue, in contrast to an earlier meeting where *"it was absolutely packed, there were people standing along the back and sides, there were people who came and couldn't physically get in."*(quote from a Health Official) The earlier meeting was held when the cause of the crisis was unknown and there was still a possibility that the children involved could develop TB. By the time the final meeting was held, all of the children were nearing the end of six months of medication and none of the children involved had developed any signs of the disease, hence the relevance of any information presented at the meeting was apparently perceived to be minimal.

In information studies when defining behavioural characteristics consideration must be given to information seeking styles. If a change in behaviour is the desired outcome of the dissemination process, compliance with a medication routine for

example, this aspect of targeting may be crucial for the recipient. The paper reviews previous research that has identified two styles of behaviour in threatening situations. [3] Information monitors actively seek information about their situation, whilst information blunters prefer to avoid information about their situation. It is, therefore, important to acknowledge the differences in individual coping styles when tailoring the information dissemination strategy. In Ponteland, a large number of calls to a telephone information line were made by the "*worried well*" (quote from a Health official), i.e. individuals actively seeking information about a situation, which whilst not immediately threatening could pose a threat in the future. Information blunters, on the other hand, would avoid public meetings, not use sources such as the information line and therefore, pose additional problems for the information provider.

Conclusion

The paper concludes with a discussion of the commitment of resources that information targeting requires. Defining the target audience using market segmentation techniques inevitably highlights the necessity of employing a variety of dissemination methods in all but the smallest projects. In threatening situations, particular attention should be paid to individual coping styles when targeting information. Compensation for the commitment of time and other resources is, however, the knowledge that the information disseminated is more likely to be received and acted upon by the recipient. Knowing your audience well can only reap benefits for information providers.

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